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How to build a small railroad town

Step by step instructions to make realistic streets, structures, and signs

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Double-deck N scale track plan

HOW TO

- Hide a tunnel entrance with trees, step by step
- Make a control panel
- Improve DCC performance with back EMF

Steve Harris models Durango, Colo., on a two-foot deep layout. See page 34

PLUS

- Scale drawings for a Fruit Growers Express car
- Add realistic details to an Amtrak F40PH diesel

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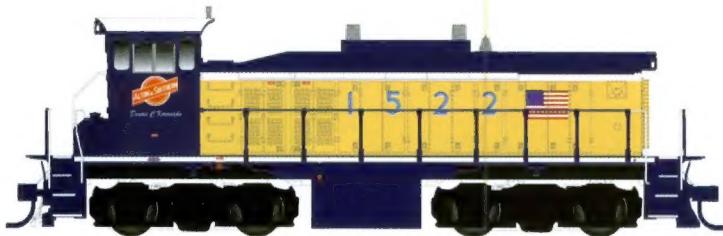
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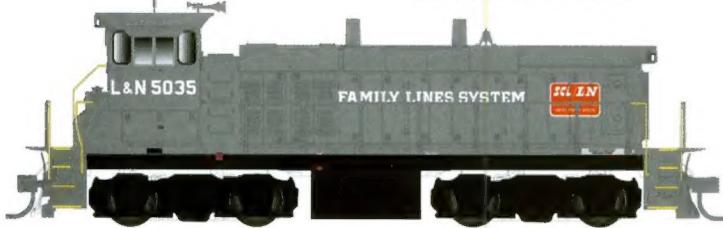
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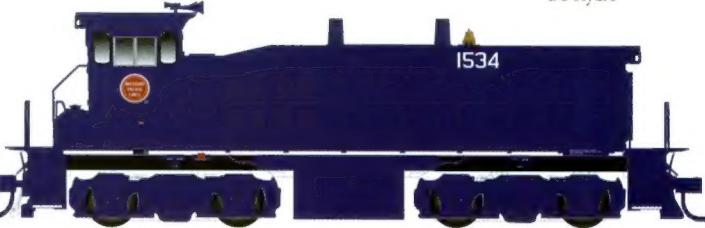
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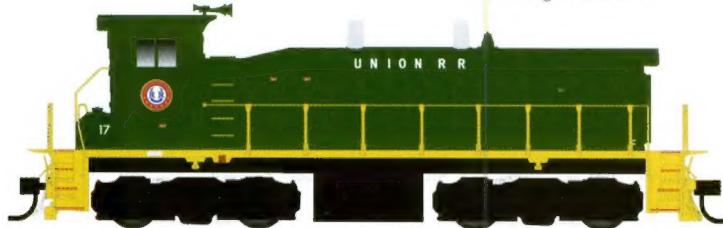
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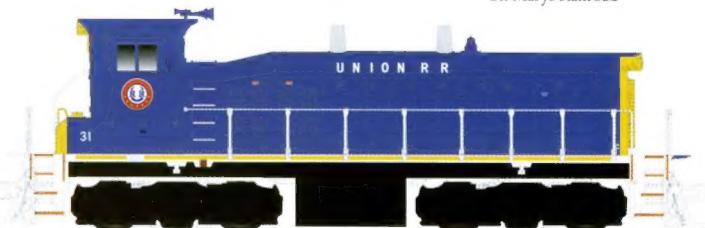
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HO is available in Silver (NMRA 8-pin plug for DCC) or Gold (DCC/sound), Standard or DCC equipped (N), Scale Speed™ motor (N), Five-pole skewed armature motor with dual flywheels (HO), Exhaust stacks: with or without muffler, Long hood sand fill: recessed or extended, Rear sand fill: three variations of sand boxes behind cab

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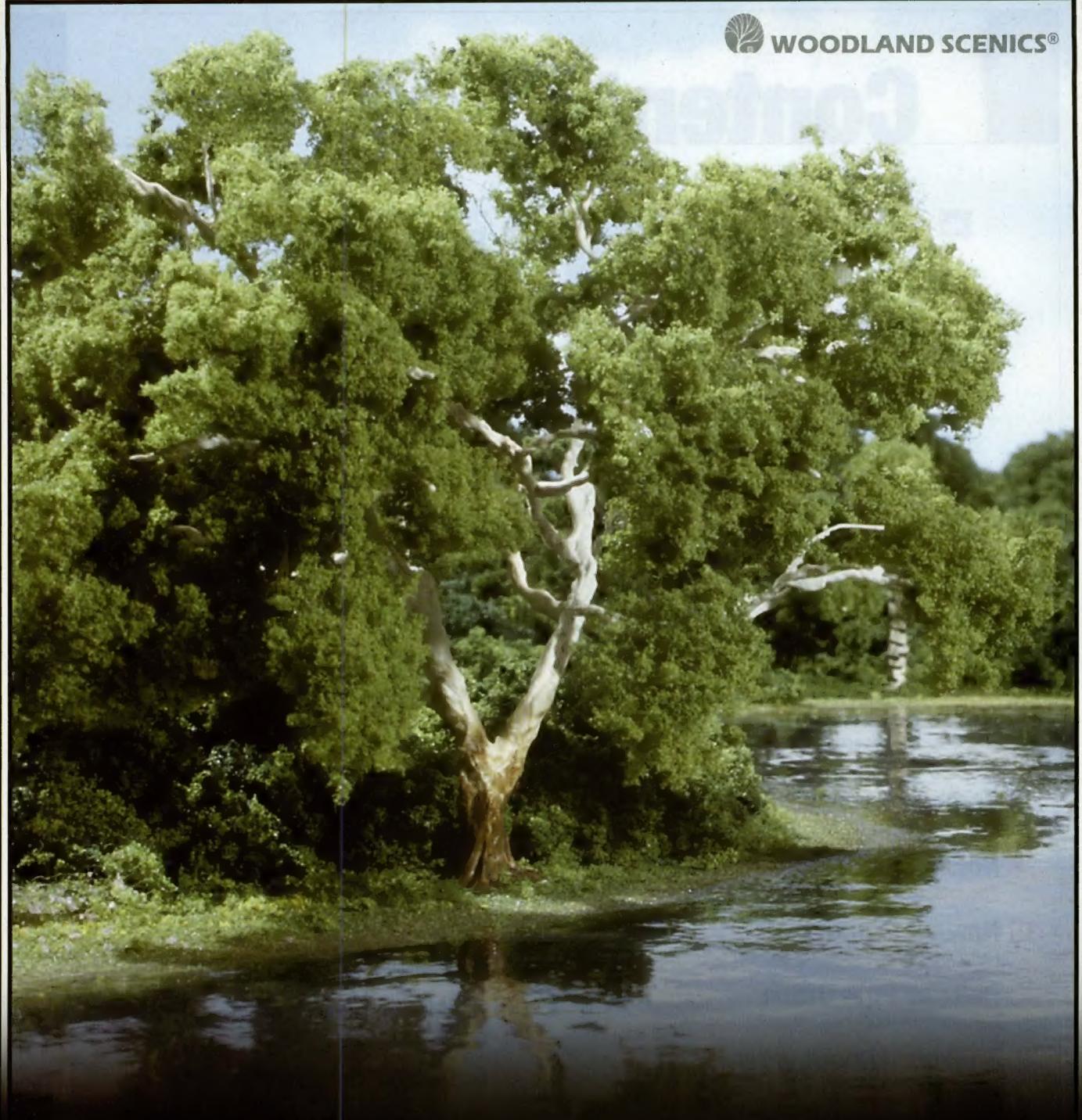
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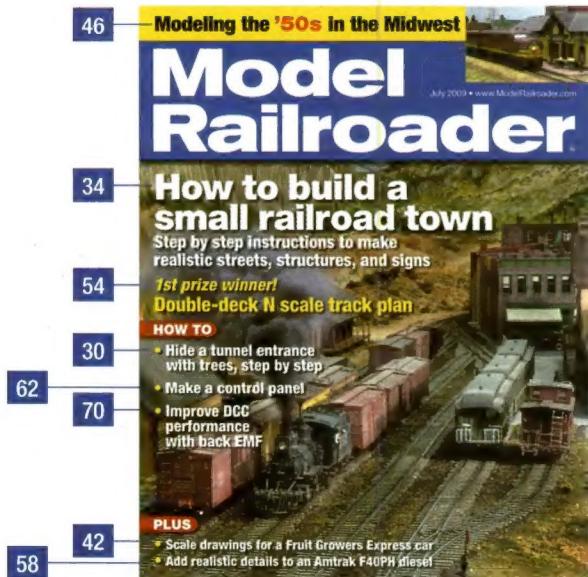


HO SCALE.
COUNTRY STORE EXPANSION

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07/09

Volume 76,
Number 07



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Pre-production MOPAC Dayniter shown. Production model will have 41-N-11 trucks and blue roof.

From the Editor

Comments encouraged

Neil Besougloff, Editor



Model Railroader's readers love to comment about all things model railroading. Some comments we receive are enlightening, others are constructive, still others are corrective, and a small number, well, let's just say those folks are having a bad day.

Comments arrive via the U.S. Postal Service, telephone, and, in the past decade, overwhelmingly through e-mail and the Internet. (That's P.O. Box 1612, Waukesha, WI 53187-1612; 262-796-8776; and mrmag@mrmag.com, respectively.) These addresses are listed in the box on the right-hand side of this page in every issue.

Your best bet if you are looking to get your comments published in *Model Railroader* would be to send them in letter form to our monthly Railway Post Office column (rpo@mrmag.com or Railway Post Office, *Model Railroader*, P.O. Box 1612, Waukesha, WI 53187-1612).

None of us on staff has counted, but since 1934 *Model Railroader* has easily received millions of telephone calls, letters, and now e-mails.

Moving beyond letters and e-mails, many sections of our Web site ModelRailroader.com now have write-in boxes that allow you to post comments and questions on the spot. There are write-in boxes at the bottom of locomotive-review pages, issue-preview pages, and even at the bottom of the page for "Cody's

Office," our new products/modeling tips weekly video. We are adding more write-in boxes (the tech guys call these "comment fields") all the time.

Product reviews draw a lot of comments, and last year we expanded our Web site to include reviews written by readers. If you're a subscriber and you've bought something new you want to tell others about, go straight to the beige review box on our home page, click on "submit a review," and start typing. We'll even supply a photo if you don't have one. These reviews have a long shelf life and won't be buried by new material in a few days, as is the case with reviews posted straight to the busy *Model Railroader* forum.

The mother lode of comments can be found on our forum. Since we began using the current *Model Railroader* forum software, more than 850,000 comments have been posted on 70,000-plus topics. Anyone can look at the forum postings, and if you register on our Web site, you can add your own comments or start a new discussion topic.

With many ways to reach out, there's no need to be shy when it comes to commenting on model railroading topics, our Web site, and of course *Model Railroader* magazine.

NEIL BESOUGLOFF

Contributing to *Model Railroader*

We welcome contributions from our readers, including articles, photographs, and prototype drawings. For detailed information on submitting material to MR, contact our editorial associate Eric Stelplug at 262-796-8776, ext. 583, or mrmag@mrmag.com. *Model Railroader* assumes no responsibility for the safe return of unsolicited material. We assume unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases, and club news items are contributed gratis.

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17410	SD70M Southern Pacific #9807*	17407 SD70M Norfolk Southern #2597
17411	SD70M Southern Pacific #9822*	17408 SD70M Norfolk Southern #2644
17412	SD70M Southern Pacific #9801*	17409 SD70M Norfolk Southern #2599
17404	SD70M CSX #4680	17416 SD75M Santa Fe #207
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Illustration shows two Hulett Unloaders, typical of most prototype installations; kit includes parts for one complete unit.

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News & Products



HO scale Electro-Motive Division SD45 locomotive. On hobby shop shelves now is this six-axle road diesel from Athearn. The model is offered in eight road names, including this Denver & Rio Grande Western scheme; more are on the way, as well as SD45-2 and SD45T-2 variations. The direct-current model is equipped with a Digital Command Control Quick Plug and McHenry magnetic knuckle couplers. Most versions are priced at \$99.98; the Southern Pacific model, equipped with elephant ears, is \$109.98.

Hobby news

Second U.S.-prototype model railroad convention in Germany: The Model Railroad Organization of Germany is planning to hold its second convention for European modelers of North American-themed railroads. The event will be larger than last year, and is moving to a new venue, the Bürgerhaus (community center) at 63110 Rodgau Nieder-Roden, near Frankfurt, Germany. The convention will feature operating model layouts in G, O, HO, N, and Z scales, as well as vendors, manufacturers, and workshops. It is slated for Sept. 19-20, 2009. For information, go to us-convention-brd.de/indexe.htm.

Rapido Trains to offer its first diesel locomotive: Canadian model manufacturer Rapido Trains is expanding into locomotives. The first entry in its True North Locomotives line will be an Electro-Motive Division FP9 diesel, decorated for several Canadian roads.

Rapido says that its model will include details specific to those Canadian roads. Sound-equipped models will include sound recorded from Canadian prototypes, as well. The HO scale models will have five-pole skew-wound can motors, prototype-specific details, and Macdonald-Cartier magnetic knuckle couplers. Direct-current models will sell for \$169.95; those with Digital Command Control and sound are priced at \$299.95. The ready-to-run locomotives will be available in late 2009.

HO scale locomotives

Alco C-420 phase 2 diesel locomotives. Apache Ry. (two road numbers available), Erie Mining, Green Bay & Western (limited edition; red, black, and white; one number), Iowa Interstate (limited edition; one number), Louisville & Nashville, Monon (black and gold, two numbers), and Norfolk & Western. Three numbers unless noted. High or low nose as appropriate for road name, etched-metal and wire details, detailed cab interior with painted crew figures, and Accumate magnetic knuckle couplers. Silver series (direct current with eight-pin Digital Command Control decoder socket): \$159.95 (limited edition, \$169.95); Gold series (with DCC and sound), \$249.95 (limited edition, \$259.95). August 2009. Ready-to-run. Master Line. Atlas Model Railroad Co.



General Electric 70-ton diesel locomotive. Bethlehem Steel (one road number available), Louisville & Nashville (two numbers), and Southern Pacific (two numbers). Also available unlettered but painted red (pictured), green, black,

12 North American Railcar Corp.'s HO Saskatchewan cylindrical hopper
13 Two-bay Airslide covered hoppers in HO scale from Con-Cor

14 Broadway Limited HO scale NYC 4-6-4 Hudson with puffing smoke
16 Club offerings
16 List of manufacturers

Steven Otte



► **Calendar**

July 5-11: 2009 NMRA National Convention and National Train Show. Connecticut Convention Center, Hartford, Conn. www.hn2009.org

Aug. 4-8: 2009 National Association of S Gaugers National Convention. Marriott St. Louis Airport, St. Louis, Mo. www.nasg.org

Sept. 16-19, 2009: National Narrow Gauge Convention. Doubletree Hotel, Colorado Springs, Colo. 29nng.com

Oct. 22-25, 2009: iHobby Expo. Donald E. Stephens Convention Center, Rosemont, Ill. www.ihobbyexpo.com

or yellow and black. Digital Command Control, directional lighting, and E-Z Mate Mark II magnetic knuckle couplers. \$69. Ready-to-run. Bachmann

Electro-Motive Division F7 diesel locomotives. Kansas City Southern (two road numbers each for both A and B units), Louisville & Nashville, Milwaukee Road (four numbers for both A and B units),

Northern Pacific (passenger scheme with "Main Street of the Northwest" slogan), and Rock Island. Four road numbers per A unit and three numbers per B unit unless otherwise noted. Etched-metal grills, prototype-specific details, and Kadee magnetic knuckle couplers. Direct-current model with eight-pin Digital Command Control socket, \$99.95 (\$94.95 per B unit); with DCC and QSI sound, \$169.95 (\$164.95 per B unit). Ready-to-run. InterMountain Railway Co.

HO scale freight cars

Thrall coal gondola. Atchison, Topeka & Santa Fe; Burlington Northern; Potomac Electric Power; and Southwestern Electric Power Co. Sixteen car numbers each, available in three five-packs plus one single car. Removable coal loads, metal wheelsets, and McHenry scale magnetic knuckle couplers. Single car \$17.98, five-pack \$89.98. October 2009. Ready-to-Roll. Athearn Trains

American Car & Foundry 5,701-cubic-foot-capacity plastics covered hopper.

General Electric Rail Services (Excel Railcar Services repaint scheme with ACFX reporting marks), Amoco Chemicals, Dupont, Fiber and Plastics Co. (AFPX reporting marks), Phillips Petroleum, Polysar, Union Tank Car, and Westlake Polymers. Two car numbers unless noted; also available undecorated. Etched-metal running boards, blackened metal wheelsets, and Accumate magnetic knuckle couplers. \$32.95 (undecorated, \$29.95). Ready-to-run. Master Line. Atlas Model Railroad Co.

Union Pacific American Car & Foundry two-bay Center Flow covered hopper.

With reporting marks for Chicago & North Western ("We Will Deliver" slogan), Denver & Rio Grande Western, Missouri Pacific (one car number with "We Will Deliver" slogan, two without), and Southern Pacific. Three numbers each unless noted. Metal wheelsets and Kadee magnetic knuckle couplers. \$31.95. Ready-to-run. InterMountain Railway Co.



N scale two-sided modern billboard.

BLMA makes this plastic and etched-metal billboard for layouts set in 1980 or later, and will soon offer it in HO scale as well. The factory-assembled model comes with 10 modeler-applied signs, and 18 more are available for free download at blmamodels.com. The N scale billboard sells for \$39.95; the HO model will be available in late 2009 for \$44.95.



Baltimore & Ohio M-26b 40-foot boxcar.

Custom-decorated Red Caboose model. "Time-Saver Service" paint scheme. Eight road numbers. Three-panel Creco doors, prototype-accurate patch panels, and Accurail trucks. Limited to 264 total models. \$34.95. Ready-to-run. Keyser Car Shops



Four-truck depressed-center flatcar.

Kasgro Rail Lines, P&H Mining Equipment, PTO Inc., Trailer Train, and Westinghouse Electric Corp. Modeler-applied wire handrails, RP-25 contour metal wheelsets, and Proto-Max metal magnetic knuckle couplers. Single cars, \$34.98; two-pack, \$69.98. Ready-to-run. Wm. K. Walthers Inc.



Saskatchewan Grain Car Corp. cylindrical covered hopper. This car's paint scheme replicates a unique prototype. North American Railcar Corp. offers these HO and N scale models in 24 road numbers, plus this 25th car. Like the prototype, this car bears a slogan and other lettering recognizing SGCC, North American Railcar, and hobby manufacturers Kadee and Micro-Trains. The 25th car is available only with the purchase of 12 other SGCC hoppers from the maker's Web site, pwrs.ca. The cars feature etched-brass running boards and magnetic knuckle couplers. They cost \$36.95 in HO scale and \$26.95 for N scale.

HO scale passenger cars



Southern Pacific Daylight passenger cars. Detailed and lighted interior, metal wheelsets, and magnetic knuckle couplers. Chair car: \$69.95 (two car numbers available). Two-unit articulated chair car (with or without antenna): \$134.95 (four numbers each). Eight-car set (includes baggage, articulated coffee-kitchen-diner, tavern car, parlor car, chair car, and observation): \$499.95 (two differently numbered sets available). Ready-to-run. MTH Electric Trains



New York Central 20th Century Limited passenger cars. Kitchen-dormitory and 68-seat full diner. Detailed interiors, sprung diaphragms, and factory-installed electrical contacts for interior lighting kits (sold separately). \$64.98 each. Ready-to-run. Wm. K. Walthers Inc.

Assorted commuter car kits. General Electric Arrow III MU car, comes with trucks and decals, \$100 for single unit, \$180 for powered and dummy pair. Comet III

powered and dummy, with trucks, \$60. Shoreliner II powered and dummy, with trucks, \$60. IC/Metra Highliner MU car, \$170 per two-car set. Chicago Transit Authority 2600-series EL car, \$100 per two-car set. All are cast resin. Imperial Hobby Productions

HO scale structures

Reith Building facade. Cast-resin facade, laser-cut three-ply Bristol board windows and doors, and acrylic window glazing. \$34.99. Ultra Scale II Models, a division of Chooch Enterprises



Southern Pacific Arbuckle, Calif., depot. Wood kit includes laser-cut walls, dock, windows, doors, details, and shingles. Semaphore, fire hose, and chimney also included. 5 1/4" x 11" footprint. \$89.98. Sidetrack Laser

HO scale details and accessories

Tru-Mate die-cast metal magnetic knuckle couplers. Regular or long shank (long shank available in two-pack only). Two-car pack (four pieces), \$3.49. Four-pack, \$5.95. 10-pack, \$13.97. 20-pack, \$25.49. True Line Trains



Die-cast metal construction vehicles. Volvo A40D articulated hauler and JCB 3CX backhoe loader. Positionable parts with moving lift cylinders, detailed cab interiors, and rolling vinyl tires. Hauler, \$29.99; backhoe loader, \$38.99. Made by MotorArt, available from Silvergate Distributors Inc.

N scale locomotives

Electro-Motive Division SD35 diesel locomotive. Atlantic Coast Line, Baltimore & Ohio, Conrail, EMD Leasing, Norfolk & Western, Seaboard Coast Line, and Utah Ry. (two road numbers available). Three numbers unless noted; also available undecorated with high or low nose. Directional lighting, prototype-specific details, and Accumate magnetic knuckle couplers. Direct-current model, \$104.95; with Digital Command Control, \$139.95. September 2009. Ready-to-run. Master Line. Atlas Model Railroad Co.

N scale freight cars

86-foot auto-parts boxcars. Double-door car: Canadian National

THE MODEL OF THE MONTH!



HO scale Airslide covered hopper.

Available now from Con-Cor is this two-bay Airslide covered hopper.

Designed to carry material like sugar, flour, or cement, the hoppers come painted for 10 roads and private owners. The cars have RP-25 contour blackened metal wheelsets and magnetic knuckle couplers.

They sell for \$22.98 each, or in two-packs for \$40.98.

(Grand Trunk Western reporting marks), Norfolk Southern (single car only), Conrail (New York Central reporting marks), Southern Pacific (St. Louis Southwestern reporting marks, single car only), and Southern Ry. (single car only). Four-door car: Conrail (single car only). Etched-metal details, magnetic knuckle couplers, and cushion draft gear enclosures. Single car, \$24.95; two-packs, \$49.90. Bluford Shops

Santa Fe Refrigerator Dept.

wood reefers. Class RR21 (no slogan), RR23 (*Super Chief*), RR27 (*El Capitan*), RR28 (*Texas Chief*), and RR32 (*Grand Canyon* and *Scout*). Six new car numbers each. Micro-Trains trucks and magnetic knuckle couplers. \$21.95. Ready-to-run. InterMountain Railway Co.

N scale passenger cars

Pullman 4-double-bedroom, 4-compartment, 2-drawing-room sleeper cars. Canadian National, Chicago & North Western, New York Central, Pennsylvania RR, and Union Pacific (Armour Yellow



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- Adaptable to Earlier Rolling Mill Kit
- July Delivery



B. LARRY & QUENCH CAR KITS

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HO scale New York Central Hudson with puffing smoke. In hobby shops now is this Digital Command Control-equipped model of a class J1e 4-6-4. The locomotive is the first from Broadway Limited Imports' Paragon 2 line to be upgraded with a DCC-controllable, speed-synchronized smoke unit. The model also has a five-pole skew-wound can motor, die-cast metal magnetic knuckle couplers, and dual-mode sound. The locomotive sells for \$349.99.

or Overland Gray). Four car names each. Interior detail with lighting, wire grab irons, and Micro-Trains trucks and magnetic knuckle couplers. \$39.95. Ready-to-run. InterMountain Railway Co.

Arched roof baggage-express car. Canadian National ("Wet Noodle" herald); Delaware, Lackawanna & Western ("Route of the *Phoebe Snow*" slogan); Great Northern; Rock Island; Southern Ry.; Southern Pacific (*Daylight* scheme); St. Louis-San Francisco (Frisco); Union Pacific (dark olive with sans-serif herald); and Western Pacific. Multiple numbers available. Sliding doors and Micro-Trains magnetic knuckle couplers. Reserve before July 1. Price to be announced. Wheels of Time

N scale details and accessories

Diesel sanding tower. For two tracks. Plastic construction with etched-metal ladder and railing. Factory assembled and painted. \$22.95. American Limited Models



Transit motor coach. Avenue B and East Broadway (New York City), Chicago Transit Authority, Los Angeles Transit Lines, Massachusetts Bay Transportation,

Milwaukee & Suburban, Montreal Transportation Commission, Seattle Transit System, and St. Louis Public Service Co. Rolling vinyl tires, detailed interior, and changeable bus route sign. \$25.95. Wheels of Time

Spine car detail set. For 48-foot five-unit car by N Scale Kits. Etched brass sheet includes tread plate and wheel tray detail overlays for all five cars in set. \$14.75. MLE Scale Models

O scale freight cars

Evans 53-foot double-plug-door boxcar. New paint schemes: Toledo, Peoria & Western; Van Brode Milling (limited edition); Vermont Ry.; and Wisconsin & Southern (*Model Railroader* 75th anniversary commemorative scheme, pink Fight Against Cancer scheme, or Sargent Cheese billboard). One car number each, except two for TP&W and VR; also available undecorated. Sprung die-cast metal trucks with scale profile wheels, separately applied details, and scale magnetic knuckle couplers. \$69.95 (limited edition, \$71.95). Ready-to-run. Atlas O

V-deck pulpwood flatcar with load. New car numbers: Atlantic Coast Line; Louisville & Nashville; Delaware & Hudson; and Gulf, Mobile & Ohio (two car numbers each). New paint scheme: Texas & New Orleans (four car numbers available). Also available undecorated. Removable pulpwood load and scale magnetic knuckle couplers. \$59.95. August 2009. Ready-to-run. Atlas O

O scale structures



Hancock Pond water tank.

Bridgton & Saco River RR prototype. Laser-cut wood kit includes tab-and-slot construction, resin spout, stair jig, and peel-and-stick trim. 3 3/4" x 4 1/2" footprint. \$62.95. American Model Builders Inc.

O scale details and accessories

SA type searchlight signal.

Brass construction. Dual-head bi-color light-emitting diodes and detailed cabinet with opening door. \$34.99. N.J. International Inc.

Z scale locomotives

Electro-Motive Division GP35

diesel locomotives. Atchison, Topeka & Santa Fe and Southern Pacific (both in "Kodachrome" pre-merger paint schemes). Magnetic knuckle couplers. \$195.95. Ready-to-run. Micro-Trains Line Co.

Z scale freight cars

Assorted freight cars. 70-foot Gunderson Husky Stack well cars: Northwestern Oklahoma RR (freight car red, two road numbers available), \$36.45. Pullman-Standard 50-foot double-door boxcars: New York, New Haven & Hartford (McGinnis orange with large herald, two numbers); \$25.90. Magnetic knuckle couplers. Ready-to-run. Micro-Trains Line Co.

Z scale structures

Wood grain elevator. Laser-cut wood kit. Peel-and-stick micro-plywood doors, windows, and trim. \$44.95. Micro-Trains Line Co.

Z scale details and accessories

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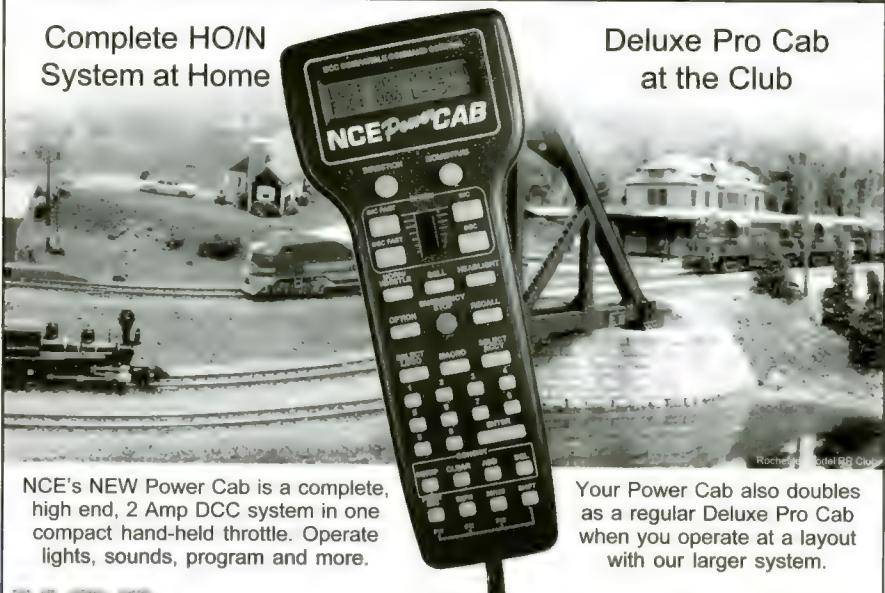
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Tractors in the field

In reading Tony Koester's Trains of Thought column, "Turning the corner" in the May 2009 issue of *Model Railroader*, I agree totally with his observation regarding crop furrows being run all the way to the fence line. I was raised on a farm and planted many crops. We never ran the farm machinery into the fence.

Dale Ridgeway
Bishopville, Md.

Diesel-era grain operations

I enjoyed reading the May 2009 issue of *Model Railroader*. As I was looking through it, Cody Grivno's article, "Moving grain in boxcars," caught my interest. My first after-school job was unloading wheat from boxcars at the Red Wing Milling Co.

Cody was right about this operation being difficult and time-consuming. It was also extremely dirty (particularly winter wheat) and dangerous work, not to mention cold in winter and hot in summer. As the saying goes, "whatever doesn't kill you will make you stronger." It was pretty much a toss-up for a while.

Ken Walsh
Minneapolis, Minn.

Weigh-in-motion operation

About 10 years ago, I lived near a weigh-in-motion scale on CSX, just east of Cumberland, Md., at Greenspring, W. Va. On quiet nights, I heard the wheels clacking over the rail joints as coal trains crept over the scale.

One afternoon when I was railfanning at Greenspring, I spoke to a crew using the scale. This is how the operation went, and I think it would be interesting to include it in an operating session.

Coal drags heading east out of Cumberland would take the scale siding about a mile west of Greenspring. The scale would weigh and report each car in the consist to a CSX office in Jacksonville, Fla. At Greenspring, an old station sat in the middle of a wye.

Once clear of the scale, the crew would use a telephone in a call box attached to the station to call back to Cumberland. They would get the report from Jacksonville on cars in the consist that were overweight.



Christopher Taylor built this coffee table layout using a track plan from the September 2001 issue of *Model Railroader*. Photo by Christopher Taylor

Coffee table layout

I always thought that having a model railroad layout in a coffee table would be a lot of fun, but when I was younger, that dream seemed unobtainable.

Recently, I stumbled upon a box of *Model Railroader* magazines that I saved, and after reading the coffee table layout again, it started to tug at my heart.

Around that same time, my aunt gave me some N scale rolling stock that I had played with when I was a youngster. The timing was perfect,

so I decided to build the table. I modified the original track plan to make running the train easier for my five-year-old son.

I'm glad I held onto those old issues of MR. The spirit of model railroading continues on with my son, and I can live out my childhood again vicariously through him. [For more information on building a coffee table for a layout, see the February 2009 MR. — Ed.]

Christopher Taylor
Oro Station, Ontario, Canada

and relay the information to the crew at Greenspring.

Overweight cars overburden wheel bearings and can cause overheating and axle failure, another reason to weigh cars besides calculating revenue. The crew set the overweight cars out on the wye at Greenspring and continued east.

Later, a local crew spotting cars at Greenspring for the South Branch Valley RR would pick up the cars and take them about 10 miles back to Cumberland. Once in Cumberland, some coal would be unloaded from the hoppers with a front-end loader and the cars would be put in the next train east. I never understood why the cars weren't weighed in Cumberland before the train left the yard, but there must have been a reason.

Tim Rasinski
Gettysburg, Pa.

Correction

The photo of Union Pacific GP38-2 no. 604 outfitted with snow-fighting gear in the article "Winter warrior" on page 25 of the May 2009 MR was incorrectly credited. The picture is from the Union Pacific RR's 2009 calendar and was taken by Matt Stentz. We're sorry for the mixup. — Jim Hediger, senior editor.

Comments, suggestions, and additional information on *Model Railroader* articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to Railway Post Office, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail rpo@mrrmag.com. Please include your name, city, and state.



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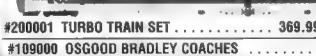


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Trolley service is now offered in Savannah, Ga.'s, downtown tourist area. However, the car doesn't use an overhead wire. Brian Cudahy

Run a trolley with an invisible wire

It's often been said that model railroaders can find a prototype for just about anything. Well, here's the perfect prototype for anyone interested in adding a trolley line to their layout, especially those feeling daunted by the complexities of building an operating overhead trolley wire system.

The city of Savannah, Ga., recently inaugurated passenger trolley service over a former Norfolk Southern freight track that runs down the middle of River Street along the historic waterfront. It's a tourist-oriented operation, and passengers are treated to a ride on an authentic streetcar that formerly operated in Melbourne, Australia.

As the streetcar rumbles along, its gong clangs away and you can hear the impressive grinding of gears and hum of electric motors. But, if you listen closely, you'll also hear the muffled sound of two small diesel engines.

While the car is electrically operated, and its original trolley poles are still in place, the current is produced by a pair of compact diesel generators concealed on board. Thus, this electric trolley is self-contained and now operates without an overhead wire.

It's the perfect scenario for operating a trolley car up and down a street on your layout. — Brian Cudahy, Bluffton, S.C.

Tender siderods?



A booster engine adds traction to handle heavy loads. *Trains* collection

I have an unusual 0-8-0 switcher that has siderods on the tender's front truck. Can you explain the purpose of the siderods and what jobs these locomotives did? — Earl Brendorfer, Solon, Ohio

Siderods on the front tender truck indicate the locomotive has a booster engine. These auxiliary devices used steam from the locomotive to operate a small engine that was built into the lead tender truck. Thus, the booster engine used some of the tender's weight to enhance the locomotive's slow-speed tractive effort.

Booster engines were commonly found on heavy-duty yard switchers that moved heavy loads at slow speeds in hump yards, on cross-town transfer jobs, or on ore docks. — Jim Hediger, senior editor

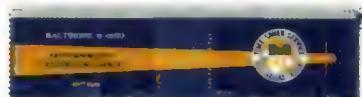


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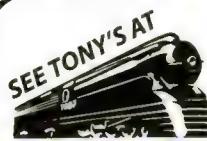
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Information Desk

Unusual steel load



A heavy load of steel breaker balls filled this well-weathered CSX 50-foot gondola traveling in a west-bound train at Warwick, Ohio, in March 2009. Bob Warrick photo

Here's a CSX 52-foot gondola with an unusual load that's easy to model. It's a load of the heavy steel breaker balls that steel mills use to begin the slag crushing process.

Slag is a red-hot byproduct of iron and steelmaking that looks like molten lava when it's dumped into the slag pits. As the slag cools, it hardens into large chunks that must be broken up before the slag can be crushed into a uniform-sized gray rock that's used for roads and secondary track ballast.

The breaker balls are solid steel and weigh up to 20 or 25 tons each. They are lifted with a crane equipped with an electromagnet and dropped into the pit to shatter the hardened slag into chunks. The pieces of slag are then fed into a crusher.

Modeling this load will be easy, since all that's required is a handful of smooth plastic balls and a modern 50-foot gondola. Paint the balls with grimy black, apply a heavy coat of rust weathering to them, and you'll be all set. —Bob Warrick, Barberton, Ohio

Handling business cars

Before Amtrak, how did railroads handle open-platform business cars on regular passenger trains that had an open-platform observation car? How would the cars be oriented, and was there a way to walk from one car to another?

George Andrews, Walkerton, Ind.

My experience with the Wabash was that first-class passengers paid extra to ride the observation car with its view to the rear, so most business cars on that railroad traveled as the last car on over-

night trains. All of these open-platform cars had standard buffers at both ends and a vestibule end that matched normal passenger cars. The end railings had a gate that opened inward to allow passage across the open platforms.

Unoccupied business cars often dead-headed behind the locomotive. Of course, sometimes a private car traveled backwards to a drop-off point so it would be facing the proper direction for further travel. On the rare occasions when an occupied business car traveled on a day train, it was coupled behind the regular observation car with both open platforms facing to the rear.

Business cars were self-sufficient, much like a big recreational vehicle. Before departure, the car attendant opened the rear platform steps so the train's flagman could hang the marker lights. Railroad officers and their guests usually boarded at the car's open platform, so they would enter at the car's parlor area. The guests didn't enter the regular train.

The regular train crew didn't collect tickets or bother the occupants, although a business car attendant might go forward to pass messages along to the conductor. The business car's end door was kept locked, and a doorbell was provided in case a trainman had to gain access. The train's flagman rode in the last regular car and opened the steps in the open platform at station stops.

Under normal operating conditions, allowing passengers to ride on the observation car's open platform at speed was frowned upon. The flagman would let passengers on the platform at slower speeds near stops, but chased everyone inside as the speed increased. At 85 mph, riding on the platform was akin to driving a station wagon down a dirt road with the rear window open! Lots of grit and dust blowing around, especially if you went over a stretch of fresh ballast. —J.D.H.

Send your questions about prototype railroading to Information Desk, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail proto@mrmag.com. We regret we can't answer all the questions we receive.



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Handy dispenser cleans paint brushes

I use a lot of acrylic paints in my modeling, especially the inexpensive paints sold in craft stores. I've found the brands sold in small plastic bottles with flip-top lids come in dozens of pastel and common colors that are useful for details and figures.

As I've worked with acrylics, I've learned that brush cleanliness is important to avoid contaminating the lighter colors. Keeping a small bottle of brush cleaner handy worked fine, but repeated use quickly dirties the cleaner and turns it into another source of contamination.

My favorite brush cleaner is windshield washer solvent (the blue stuff, without other additives). It comes in gallon jugs, so I was searching for a smaller bottle to use as a workbench supply when I spotted this plastic dispenser bottle, shown in **fig. 1**, that originally held Act brand mouth wash (made by Johnson & Johnson).

This soft plastic bottle was perfect for my purposes, as squeezing it dispenses solvent into the small upper reservoir without any back flow. This allows me to remove the cap, clean the brush in the small reservoir, and then dump the contaminated solvent.

As a safety measure, I clearly relabeled both sides of the bottle so there could be no doubt about its new contents. (The blue windshield washer solvent looks a lot like some flavors of mouthwash).

To fill the container with brush cleaner, I firmly grasped the top end of the insert with



Fig. 1 Dave VanderYacht uses a squeeze-type mouthwash bottle to hold solvent for cleaning brushes.



Fig. 2 He pulls the soft plastic insert out to refill the bottle with windshield washer solvent.



Fig. 3 With the insert in place, a gentle squeeze dispenses just enough solvent to clean a brush.

pliers and pulled (it popped out pretty easily). See **fig. 2**. Then I filled the main bottle with solvent and pressed the insert back into place.

With the cap in place, I gently squeeze the bottle to fill the top reservoir about halfway, **fig. 3**, for my next brush cleaning. — *Dave VanderYacht, Pinckney, Mich.*

Resealing tube adhesives

For years, I've struggled with preserving partially used tubes of adhesive I apply with a caulking gun. A couple of months ago I opened a new tube of Liquid Nails and used only about a third of it. I released the pressure on the plunger and stuck a two-inch drywall screw into the opening. The screw head's flared shape fits



Lionel Strang has found the flared head on a drywall screw does a great job of sealing tube adhesives.



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tightly and seals the opening to keep air away from the remaining uncured adhesive.

When I checked the tube several months later, I found the adhesive inside was still fresh. The wide head and threaded body made it easy to pull out the plug of partially hardened adhesive so I could dispense more of the fresh adhesive. — *Lionel Strang, contributing editor*

Beer line track supplies

I love the track plan for the Beer Line layout series, and I'm in the process of building the layout. However, I was disappointed that you did not include a list of track supplies that were used.

Jack Placek, Addison, Texas

Since our Beer Line project railroad was built with flextrack, every version will be slightly different. All you need to do is count up the turnouts and make a rough estimate of the three-foot track sections (about two dozen).

The plan published on page 46 of the January 2009 *Model Railroader* used the following track components:

Atlas code 83
500 36" Flextrack (24 pieces)
543 Atlas Snap-Switch,
right-hand turnouts (2)
Peco Streamline, code 83
American-prototype track
8351 No. 5 right-hand turnouts (6)
8352 No. 5 left-hand turnouts (7)
8361 No. 6 right-hand turnout (1)
8362 No. 6 left-hand turnouts (6)
Peco code 100 insulfrog
1042 right-hand double-curved
turnout (1)

During tracklaying, I tried to minimize the number of rail joints, so I didn't use every leftover piece. However, I did use most of the pieces that were a foot or more in length, as they came in handy when I fitted the industrial tracks. The curved code 100 turnout was installed between the scale house and North 2nd Street. — *J.D.H.*

HOn3 or HOn2½?

Being new to HO scale narrow gauge modeling, I'm confused about the difference between HOn3 and HOn2½. Does HOn3

have its own track components or does it use N scale track?

Ron Jarvis, Ludlow, Mass.

Narrow gauge modelers in HO scale use two different track gauges to represent two different prototypes. For HOn3 modelers, there are several suppliers of properly scaled 3-foot gauge track components. The matching HOn3 rolling stock represents various prototypes, although the Colorado narrow gauge railroads are the most popular.

The HOn2½ term refers to the use of N gauge track in HO scale to represent the tiny Maine two-foot narrow gauge railroads. However, in HO scale, N scale track measures roughly a scale 30" between the rails instead of the 24" gauge of the prototypes.

The popularity of HOn2½ modeling can be traced back to retired Kalmbach editorial vice president Bob Hayden and his friend Dave Frary, who began buying AHM Minitrains that were introduced as "HOn" models in an August 1965 ad. These trains were reviewed as HOn2½ models in the September 1965 MR, and an AHM ad in the same issue also referred to these trains as HOn2½ models.

By the early 1970s Bob was kit-bashing small HOn2½ diesel locomotives powered with smooth-running N scale mechanisms. This allowed him to use N scale track components and trucks to create his own freelanced "modern" Maine narrow gauge railroad.

Upon discharge from the Navy, Bob moved back to New England, where he and Dave Frary combined their efforts to build an HOn2½ empire in Dave's basement. More information on this layout can be found in Bob's article "Building and rebuilding the Carrabasset & Dead River Ry.," published in the February 1980 *Model Railroader*. — *J.D.H.*

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An Alco RS-2 leads a Southern Ry. peach train out of the South Carolina woods on the N scale Spartanburg Subdivision layout. Associate Editor Steven Otte shows how he hid the tunnel entrance with trees and foliage.

Disguise a tunnel entrance with trees

Tunnels can be useful on model railroads to hide staging tracks, conceal turnback loops, and make a finite layout look like it goes somewhere. But not all prototype roads had tunnels.

Tunnels are expensive to build and maintain, so prototype railroads avoided them if they could. What can you do if your layout

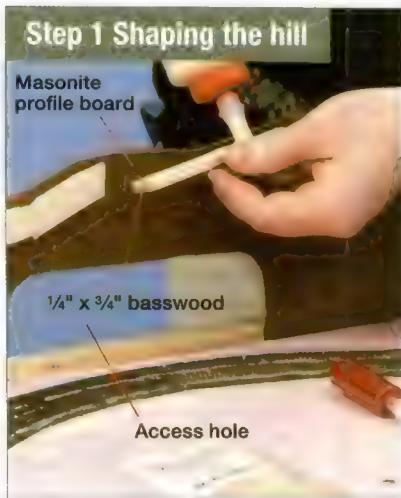
needs a tunnel and the locale you're modeling doesn't have any?

One common trick to disguise a tunnel entrance is to run the track between two buildings or under an overpass. But there's another variation you might find useful: Send your train into the woods.

The entrance to a tunnel through a wooded hill can be

concealed by trees and foliage. The train makes its way beneath tall trees' overarching branches, until it seems to disappear into the increasingly dense forest.

Follow along as I show you how I added a hill to my N scale Southern Ry. Spartanburg Subdivision layout and made a tunnel entrance that vanishes into the trees. **MR**



I wanted to conceal a stretch of double track on one end of the Spartanburg Subdivision layout so one track could be used as hidden staging or as a passing track. The first step was to rough in the shape of the hill over the track.

I cut profile boards from $3/16"$ Masonite and glued them in between the layout's framing boards and its extruded foam surface. Since the tunnel would be long and have small portals, I cut an access hole in the longer of the two boards, in case I ever have to retrieve a derailment.

To provide an anchor for the top of the hill, I glued strips of $1/4" \times 3/4"$ basswood along the tops of the profile boards. Once they were secure, they would provide a place to attach the hill's surface material.

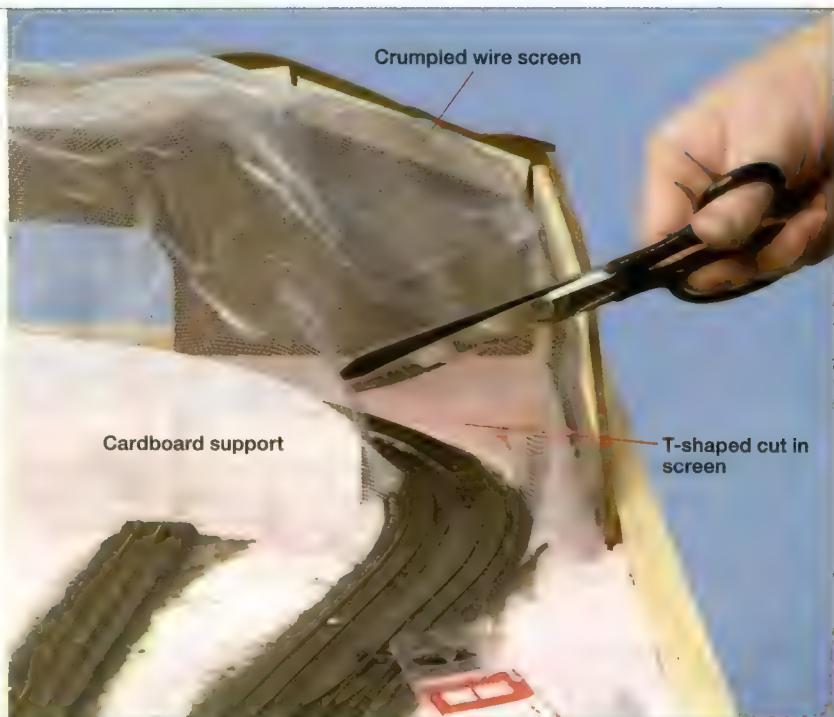
I used aluminum screening to form the hill itself. I could have used cardboard strips or stacked foam board, but I like the random, organic shape I got by crumpling, then unfolding, the metal screen. I also wanted a material that would let me plant trees wherever I wanted. The holes in the screen would be just the right size for the

Shaping the hill (cont'd.)

pegs at the base of the Woodland Scenics trees I planned to use to landscape the hill.

I knew that the screen could sag down and obstruct the tunnel, so I cut two slits in the foam base on either side of the track and inserted curved cardboard walls along the inside to keep the screen off the track.

After tacking the screen to the profile boards with a staple gun, I made a T-shaped cut above the track and folded the screen down on either side to form a tunnel entrance. (I used an old pair of scissors, since screen will quickly dull them.) I then trimmed the edges of the screen where they met the ground and secured them with wire nails I pushed into the foam surface of the layout.



Step 2 Building the shell

I wanted the train to be partly visible through the screen at the entrance to the tunnel. I would add foliage to make this look like a tangle of tree branches. To keep the silver screen from spoiling that illusion, I protected the track with paper and masking tape, then spray-painted the screen brown.

I left the paper protecting the track in place for the next step, in which I covered the hill with paper towels dipped in plaster. I left a few inches around the tunnel entrance uncovered, though. I wasn't concerned with wrinkles, since I would be covering it with foliage.

After the plaster dried, I brushed on brown latex paint and sprinkled on Scenic Express Blended Turf ground foam. I fixed it in place with Woodland Scenics Scenic Cement.

Next, I tossed a handful of medium green lichen that I'd sprayed with aerosol adhesive in a plastic tub of light green ground foam. I glued the lichen to the screen on either side of the tunnel. I had intended to use the lichen to model the treetops on the hill, but I didn't like how it came out, so I only used it as underbrush.



Step by Step

Step 3 Planting the trees



I assembled about two dozen deciduous trees from Woodland Scenics kits, ranging from $\frac{3}{4}$ " to 3" tall. I drybrushed the plastic armatures with medium gray and

earth-toned acrylic hobby paints to bring out the texture, twisted them to shape, then glued on the foam foliage that came with the kit. To give them more variation, I sprayed

the crowns of the trees with spray adhesive and sprinkled on various colors of fine ground foam.

I then planted the trees around the entrance of the tunnel. I started with the taller ones, pushing the pegs on the bases through the holes in the screen. Before securing them in place with wood glue, I adjusted the armatures so the branches would arch out above the track. I continually checked the clearance with my N scale National Model Railroad Association clearance gauge to be sure the branches didn't hang into the path of the trains. I stuck one of the trees into the screen directly above the track, as though it were just a branch of a larger tree.

Step 4 Topping it off



I wasn't satisfied with the look of the lichen I had originally planned to use to cover the remainder of the

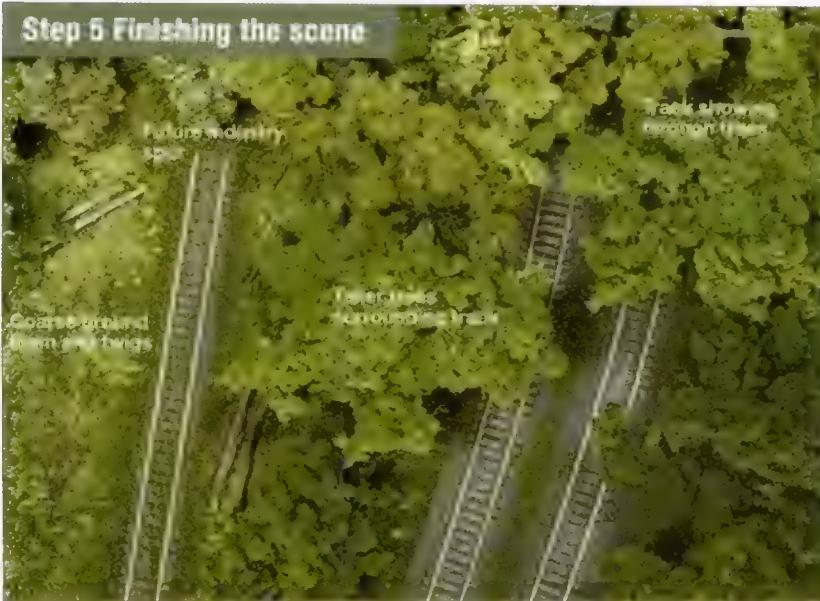
hill. So I used foam foliage, as I'd used on the trees. I should have thought of this from the start, as it

better matched the trees around the tunnel entrance.

After spraying the hill with adhesive, I stuck on roughly torn patches of Woodland Scenics clump foliage in medium and dark green. I then gave it the same treatment as I had the treetops, spraying it with adhesive and sprinkling on various shades of fine ground foam. This gave the hill a realistic, springlike look.

I also planted a couple of Woodland Scenics trees on top of the hill, giving the effect of a taller tree breaking through the canopy.

Step 5 Finishing the scene



Though I liked the top of the hill, I wasn't happy with the tunnel entrance, which still looked too abrupt. So I built a handful of bigger trees, 4" to 5" high, and planted them on either side of the tunnel approach. I arched their branches far over the track, forming a canopy with hardly a gap between. This made the entrance look much more natural.

Next, I used Sculptamold to vary the terrain around the tunnel entrance. Once it dried, I painted it brown, sprinkled on some turf, and added some twigs to represent deadfall. Finally, I planted a few more trees around the edges of the scene to soften the transition from flat land to hill.

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10246W	SD/SDP35, w/DCC & snd.	199.99
10298W	RS32	From 53.59
10300W	RS36	From 53.59
10305W	C420 (8/09)	103.99
10319W	C420 DCC & Snd (6/09)	162.99
10434W	U30B (7/09)	124.99
10454W	U30B w/DCC & snd (7/09)	195.99
10517W	RS3 (7/09)	81.59
10525W	RS4/5 (8/09)	81.59

N SCALE:

40157W	SD35 (9/09)	67.99
40178W	SD35 w/DCC (9/09)	90.99
42800W	GP30/35, DC (6/09)	84.99
42900W	GP30/35, w/DCC (6/09)	108.99

FLEX TRACK:	Code	Code
100	Price	83

3' section, min ord 10	168	.28.99	500	.35.88
Box of 100	168BX	249.99	500BX	309.99

ATLAS (A09) CONT'D.

JOINERS:

Metal, 48/pkg.	170	2.69	170	2.69
Insulated, 24/pkg.	55	1.49	552	1.65

TRACK & ACCESSORIES:

#4 turnout, Wye	280	9.79	560	11.59
#4 turnout, LH	281	9.79	561	11.59
#4 turnout, RH	282	9.79	562	11.59
#6 turnout, LH	283	9.79	563	11.59
#6 turnout, RH	284	9.79	564	11.59
#6 super T.O., LH	—	—	505	11.59
#6 super T.O., RH	—	—	506	11.59
#8 turnout, LH	285	11.99	565	11.69
#8 turnout, RH	286	11.99	566	11.69
Rem. snap sw., LH	850	12.99	540	13.99
Rem. snap sw., RH	851	12.99	541	13.99
Rem. mach, under table	65	6.39	65	6.39
Rem. sw. mach, LH	53	6.99	584	7.69
Rem. sw. mach, RH	53	6.99	585	7.69
9" straight, 6/pkg.	821	4.89	520	5.59
6" straight, 4/pkg.	822	3.19	521	3.19
3" straight, 4/pkg.	823	3.19	522	3.19
15" R curve, 6/pkg.	831	5.99	530	5.89
18" R curve, 6/pkg.	833	4.89	532	5.59
13'-18" curve, 4/pkg.	835	3.19	534	3.19
22" R curve, 6/pkg.	836	4.89	535	5.59
Terminal, 9" str.	840	4.09	554	4.49
Terminal, 18" str.	842	2.99	553	3.25
Railer, 3/pkg.	844	6.09	519	6.09
Track ast.	847	3.99	524	4.09

BRIDGES & ACCESSORIES:

Warren Truss	883	5.99	590	6.39
Deck truck	884	5.99	591	6.39
Plate girder	885	5.99	592	6.39
3" pier, 4/pkg.	81	4.29	81	4.29

MISCELLANEOUS:

551	Trans. rail joiner C100 to C83, 12/pkg.	2.99
2540	Track nails, 400 (approx)/pkg.	4.29

BACHMANN

MFG ID: B01

PROTO/LIFE LIKE (L04) CONT'D.

47950W	E7AB or AA	SALE 213.99
47952W	E7A or B	SALE 109.99
47757W	H1044	SALE 112.99
47794W	H1044 (2/09)	SALE 112.99
47993W	NYC E7AB	TBA
48226W	F3AB	SALE 194.99
48230W	F3A	SALE 106.99
67200W	2-8-8-2	SALE 265.99

N SCALE:

1408	Prodigy Express	115.99
1410	Prodigy Advance wireless	334.99
1412	Prodigy wireless conversion	179.99
1414	Prodigy Advance 2	216.99
DCC ACCESSORIES:		
1409	Walk around, Prod Expr	61.99
1411	Walk around, Wireless	116.99
1415	Walk around, Prod Adv 2	88.99
1501	Prodigy ext plate	23.99
1502	Prodigy ext plate powered	32.99
1628	Decoder, 4, outputs	39.99
1629	Decoder, steam sound, HO	49.99
1634	Decoder, dsl sound, PNP	38.99
1638	Decoder, dsl sound, mini	54.99
1639	Decoder, stm sound, mini	54.99
1643	Decoder, sound, HO	16.49
1662	Decoder, w/diesel sound, HO	25.49
1823	Decoder, w/steam sound, HO	56.99

POWER PACKS:

CM20	Control Master 20	149.99
9500	Power Com 30VA w/meters	92.99
AB116	Tech 4, dual control, 16VA	55.99
AB131	Tech 4, 20A & momentum	55.99
POWER PACKS:		
CM20	PNP Athearn DSL	19.99
CD123D	PNP Athearn 2-8-2	15.99
CD123PS	HO, w/short harness	18.49
CD163AT	HO, varied application	27.99
CD163D	HO, varied application	23.99
CD163P	HO, varied application	26.39
CD163PS	HO, varied application	26.99
CD165AO	HO, Atlas	21.59
CD1215	N, varied application	19.99
CD125PS	N, varied application	21.59
CDX064D	Sound w/6 functions	55.99

ACCESSORIES:

AR1	Auto reverse, 6 amp	23.99
DS64	Quad stat decoder	47.99
DT400R	Super throttle	183.99
PM42	Power mgr, 4 sect, w/auto rev	63.99
PS515	Power supply, 5 amp	39.99
PS2012	Power supply, 20 amp	139.99
UP5	Unit rail, 2 lcl/3 throt.	13.99
UT4	Utility throttle	63.99

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CIRCUITRON

MFG ID: C12

8



Townspeople go about their business in downtown Durango, Colo., next to bustling Durango Yard. Steve Harris tells how he modeled this town, which is an important terminal on his HOn3 Rio Grande Southern layout.

How to build a small railroad town

Scenery, structures, streets, and signs make a convincing scene

By Steve Harris
Photos by the author

Durango, Colo., was an important junction on the Denver & Rio Grande Western and was also the southern terminus for the Rio Grande Southern. This makes it an important part of my HOn3 Rio Grande Southern layout.

I've been modeling the RGS since 1970 and working on my current version since 1995. I work slowly, enjoying the journey and completing one scene or town before moving on to the next one. So I only recently completed my version of Durango on the upper level of a mushroom peninsula. [In a mush-

room track plan, different levels of a multi-deck layout are viewed from opposite sides of offset backdrops. -Ed.]

Durango proved to be a great place to stretch my skills, try out some new techniques, and experiment with some new ideas. And it was just plain fun to build. Here's how I did it.

Steve Harris is a resident of Valley Center, Calif., and a regular contributor to Model Railroader. His most recent article was "Build a train elevator" in the June 2009 issue. His HOn3 RGS track plan appeared in November 2004.

STEP 1 Planning

When planning how to model Durango, I had to face the fact that I didn't have room for the town's famous turntable and roundhouse (which is still in use). The area I reserved for the town is 9'-5" long by only 2'-2" at its widest point. Besides, I didn't need another engine terminal. I already modeled the one the RGS built in 1926 in West Durango, on the other side of the Animas River.

So after much thought and many compromises and diversions from the prototype, I decided to model a four-track yard with a caboose spur, some of the lineside structures, and a portion of Main Street.

Since my visualization skills are lacking, I find it useful to mock up a scene before building it. I used structures from elsewhere on my layout to stand in for the buildings that would line Main Street. I moved them around to help me envision how the scene would appear when built.



Steve used buildings from elsewhere on his layout to mock up the town of Durango before deciding where to put the track, streets, and structures. To his regret, Steve didn't have room for the city's famous roundhouse and turntable.

STEP 2 Track and turnouts



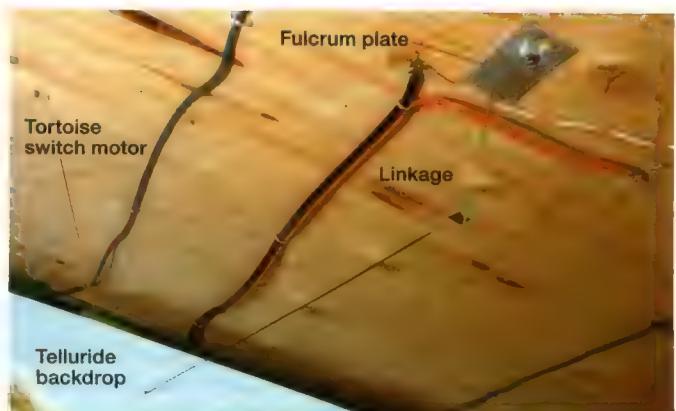
Steve decided on a four-track double-ended yard plus a caboose track for Durango. He also decided to put the tracks behind Main Street instead of in front, as on his original track plan (see the November 2004 issue of *Model Railroader*).

My original track plan called for the yard tracks to be in front of the downtown area, but I changed my mind and built the tracks behind the Main Street structures. I arranged the tracks in a gentle curve to make the yard lead as long as possible. This had the happy side effect of necessitating a curve in Main Street, thus blocking the view from one end of town to the other. This makes the sight lines from either end more interesting, and suggests a longer street.

I laminated sheets of Homasote to the 3/4" plywood subroadbed, then handlaid the track and switches using code 55 rail. Handlaying track allows me to distress and weather the wood ties and apply ballast before laying the rail.

I use Tortoise switch motors, which presented a problem in that my Durango area is on the upper part of a two-deck peninsula. The two towns face different aisles on opposite sides of the peninsula. If I were to place the Tortoises directly under Durango's turnouts, they would hang down into the sky above Telluride.

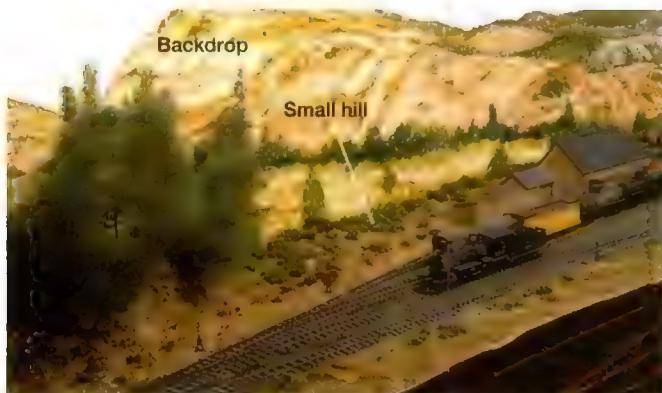
My solution was to allow a 3 1/2" space between the fascia fronting Durango and the backdrop of Telluride. I mounted the Tortoises (along with as much of the wiring as possible) in this space, and made horizontal lever extensions out of .33" piano wire to reach out under the turnouts. I soldered these



Switch motors for Durango would have hung down into the airspace over Telluride, on the deck below. Steve instead put them in a narrow space behind Telluride's backdrop.

wires to vertical lever wires which extend up through a fulcrum (a small piece of sheet metal with an appropriate sized hole, screwed to the bottom of the roadbed), and then on up through the roadbed to the turnout switch rod.

STEP 3 Scenery



To disguise the joint between the tabletop and backdrop, Steve built a low hill behind the tracks and structures. He covered the low hill with paint, dirt, and ground foam.

Although some of the most beautiful mountain scenery in the world is just out of town, Durango itself is located in an arid area. My friend Greg Gray had depicted this well on the backdrop, and I wanted to replicate it on a strip of low hills in front of the backdrop. These low hills hide the abrupt seam where the tabletop meets the backdrop.

I formed the hills from extruded-foam insulation board and Sculptamold. I painted the hills with a dirt-colored latex paint and followed up with a sprinkling of real dirt and ground foam glued down with diluted matte medium. With the paint, dirt, and ground foam, I strove to match the colors Greg had used on the painted backdrop.

STEP 4 Lineside structures



Steve built the Durango Station from a Ragg's to Riches kit. The other lineside structures he scratchbuilt from scribed wood siding with Grandt Line windows and doors.

I scratchbuilt most of the lineside structures from scribed wood siding with Grandt Line doors and windows. These structures include tool sheds, an icehouse, freight house, yard-master's office, and section house.

Prototype photos show that in 1939, maintenance on these structures had been neglected. To replicate the look of peeling paint, I first applied an undercoat wash of alcohol with a few drops of India ink, then used a terry cloth rag to dab on thinned Floquil Depot Buff.

I used a Ragg's to Riches kit (www.raggstoriches.biz) for the depot. Period photos showed the depot in good repair, unlike the other structures, so I finished it with little weathering.

STEP 5 Modeling Main Street structures



Though Steve found no shortage of building kits that would fit the look of Durango in the 1930s, he had to swap, remove, or replace walls on several of them to make the buildings fit the curve of Main Street.

In order to get a feel for Durango in 1939, I ordered period photos from the Denver Public Library (www.photoswest.org/presearch.html) and studied similar views in *The RGS Story, Vol. XI* by Russ Collman (Sundance, out of print).

The pictures showed a vibrant small town with lots of awnings of different sizes and shapes. Although dating back many years, the structures were outwardly in good repair.

I considered scratchbuilding the brick Main Street structures, but to accurately replicate each of the seventeen buildings was a larger project than I wanted to take on. It wasn't absolutely necessary either, given that there are lots of Main Street-type structure kits available. Even so, I did have to move or replace walls on some of the buildings in order to fit the curve of the street.

STEP 6 Paving the streets

I had a couple of concerns when building the street itself. I used sheet styrene as a base, but I was worried about hiding the seams between sections. After some experimentation, I arrived at what seems to be a good solution.

After cutting the sections to fit from .030" styrene sheet, I beveled the edges that would butt up to each other, leaving a V-shaped groove at the joints. I then sanded the underside of the sections to give the styrene "tooth" and glued them to the Homasote tabletop with contact cement. Next, I filled the beveled grooves at the seams with modeler's putty. After a little sanding and paint, the joints became invisible.

It took a few more experiments to replicate the texture and color of blacktop. On a test section, I lightly sanded the top of the styrene, then airbrushed on a coat of Floquil Grimy Black. This replicated the color well, but the roads needed texture. The next coat was a quick application of faux granite-finish spray paint I found at a craft store. The texture was far too coarse for HO scale blacktop, so I tried sanding the paint. This worked to smooth out the texture, but it still left white spots that were out of scale, so I sprayed on another layer of Grimy Black.

Finally, I applied streaks of dark gray powdered paint pigments to mark the heavily traveled areas, and lighter shades to represent less worn areas on the edges and center of the street.

I have found that using cotton swab sticks to apply pigments or pastels gives me much more control than a brush, although the swabs do have to be replaced often.

Prototype streets have a slight crown in the middle to facilitate water drainage. I considered modeling this feature, but my model includes a cross street which would require me to join styrene sections in compound curves. I left my streets flat rather than endanger the integrity of the seams.



Like many modelers, Steve made his streets out of sheet styrene. He hid the joints with modeling putty.

STEP 7 Sidewalks

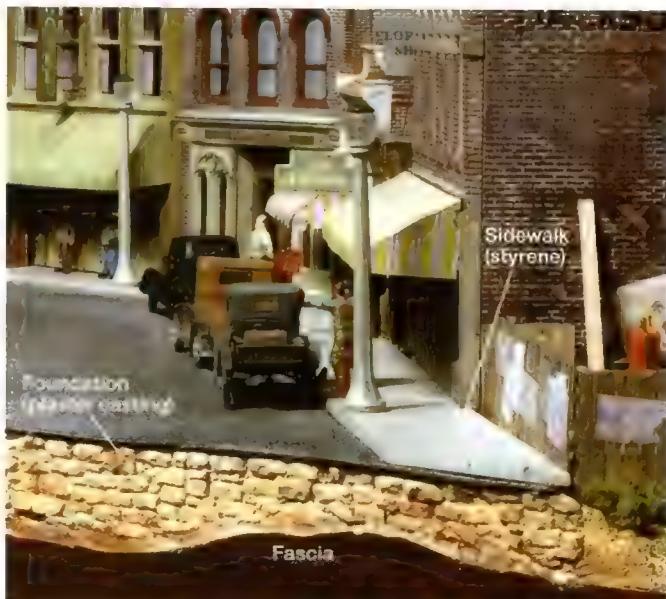
I wanted the sidewalks to be a scale 6" high, which is about .68" in HO scale. I cut and laminated two sheets of styrene, one .50" and the other .20", to make up a close-enough .70" high. I cut scale 7-foot-wide sections out of this, rounded the corners and edges with a sanding stick, then scribed expansion lines and cracks.

I painted the sidewalks a mixture of Floquil Grime and Aged Concrete, then gave them a light wash of alcohol and India ink to bring out the cracks.

I am often asked about the stone foundation visible under the street and sidewalks at the edge of the layout. I'm embarrassed to say that this is actually the solution to a problem caused by a change of plans.

At the time I installed the fascia, my plan was to model the yard tracks in front of the town, so I randomly cut undulations along the top of the fascia to present a more natural brink. I thought the scenery that would meet this edge would be natural terrain. Then when I decided to move the town to the front, requiring me to pave the area, I needed a way to fill the space under the street.

My solution was to use a rubber mold of a stone wall to make thin plaster castings. I cut the castings to shape with a hobby knife and glued them into place. I filled the area behind the castings with plaster, then colored the walls with acrylic washes.



Durango's sidewalks are two sheets of styrene laminated together to reach a height of .070". The stone foundation seen under the street at the layout's edge was necessitated when Steve moved the town to the edge of the fascia, which he had already cut to a wavy profile.

STEP 8 Awnings and other details



Awnings and window treatments created with Photoshop image-editing software brighten Steve's Durango street scene.

My friend Joe D'Elia of A-Line Models showed me how to make the awnings. For rectangular awnings, I cut the base out of .015" styrene, then assembled the three parts to make up the triangular awning shape.

The awnings on the arched windows started with a base made of an oval of styrene cut into two pieces and glued at 90 degrees to each other. I then wrapped a piece of .010" styrene over the curve of the base and back pieces. I used a rubber band to hold the styrene in place while the glue dried.

I found stripe patterns on the Internet using Google Image Search (images.google.com). I downloaded the stripe image, then used Adobe Photoshop image-editing software to resize it so each individual stripe would be about 6 scale inches wide. Still in Photoshop, I stretched the image until it was long enough to use as an awning, copied and pasted the image to widen it, added simulated canvas texture, and faded the colors to simulate weathering. I made duplicates of the image and recolored them for variety. Finally, on some, I added names of the establishments.

I printed the images on matte photo paper. On some, I cut fringe or scallops on the overhanging sections. I then glued the paper stripes onto the styrene base assemblies with contact cement.

I found another use for Google Image Search and Photoshop in making window blinds and curtains. I found an assortment of images of draperies and blinds on Google, then resized and recolored them in Photoshop. In fact, I cheated by using the same curtain images on several different structures, just changing the colors in Photoshop.

The structures in the alley facing the layout aisle may have been the most fun of the entire project. Without prototype photos to guide me, I let my imagination run wild and cluttered up the backs of the structures with vent pipes, meter boxes, electrical conduits, and outdoor lamps. My friend Jake Johnson built a couple of the structures on the alley. He opened some windows, bricked in others, and added rain gutters and down spouts.

STEP 9 Roof and window signs



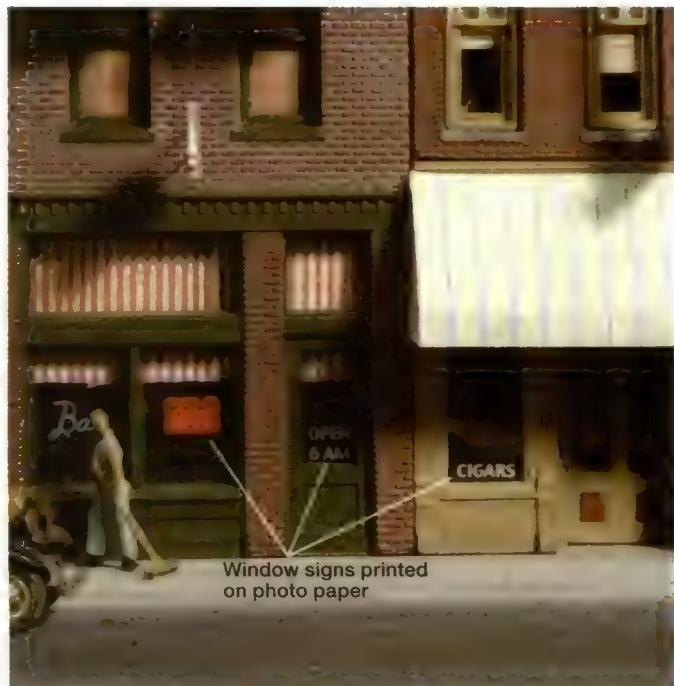
Signs give Durango's downtown structures identity and purpose. Steve made the roof signs using parts from Bar Mills kits and used his computer to make many of the storefront signs.

The prototype photos of Durango's downtown showed signs everywhere: in the windows, on the rooftops, on the walls, and overhanging the sidewalk. Reproducing these is an important part of making my town look real.

I made the "Hotel Strater" and "Eat" roof signs from a Bar Mills kit. This kit includes individual letters to be cut out and glued onto the supporting structure. I also used the Bar Mills supports for the "Sears" sign. I made it in Photoshop after finding a picture of a similar one on the Web.

Several of the structure kits included frames and decals for signs. I found that by first painting, then scanning, the sign frame and opening it in Photoshop, I could create a sign exactly the size, shape, and color of the frame. Then it was simply a matter of printing the sign out in high resolution on matte photo paper, cutting it out, and gluing it onto the frame with contact cement. I found other signs such as "Dolly Madison" and "French Bar" on the Internet and made my own frames for them from .030" styrene.

I downloaded several of the window signs, such as the "Cold Beer" sign, from the Internet and resized them in Photoshop. I printed them on glossy photo paper and covered the entire window with the printed sign. I used Photoshop's type tool to make other window signs, such as the "Cigars" sign in the store next to the bar. By putting the type on a solid black background and covering the entire window with the image, I found that, especially under the awnings, it was hard to tell the difference between this solid glossy black print and clear windows with a black view block inside the structure.



Steve made the window signs in Adobe Photoshop and printed them on photo paper. When placed behind window glazing, signs printed on a black background look like window signs in front of a black view block.

STEP 10 Wall signs and posters



Steve made the "Dry Climate Cigars" wall sign from a digital photo of an actual wall sign, which he resized and color-corrected in Adobe Photoshop, then printed on decal film. The posters were printed on regular paper.



To reduce his posters to close to scale thickness, Steve sprayed the printed surface with Dullcote, then rubbed the back with a wet finger to remove most of the paper. When he was done, he had ink and a very thin layer of paper left.

Period photos show that almost every building in Durango had a large sign painted on the wall. I replicated these in a couple of ways.

I had taken the picture of the "Dry Climate Cigars" sign in its original location in Cripple Creek, Colo., back in 1978 and I finally got to use it on a model. Because I had taken the photo from street level, I used Photoshop's Crop tool to fix

the perspective distortion before resizing and recoloring the image to match my model brick color. [For more on correcting perspective in Photoshop, see "Make your town look bigger with digital buildings" in *How to Build Realistic Layouts 4: Towns and Cities*. – Ed.]

The "J. Johnson Furniture," "Jackson Hardware," and "Strater Hotel" wall signs were much simpler to make. I used the Type tool in Photoshop to type out the lettering in the appropriate size and color. I printed the signs on decal paper and applied them to the walls.

I made the posters that line the alley walls by searching the Internet for 1939 movie posters and vintage circus posters. I then used Photoshop to size the images and fade them for a weathered appearance. I then copied and pasted multiple posters on one sheet.

To thin the posters to scale size, I printed them on regular printer paper, then sprayed the surface with Testors Dullcote. After the Dullcote dried, I cut out each poster with a hobby knife, then carefully rubbed the back of the poster with a wet finger. This caused most of the paper to curl up and peel off. I put a small amount of water in a container on my workbench to wet my finger in, then rubbed the back of the printout until all or most of the paper was gone, leaving only the printer ink and the Dullcote. As I discovered, it's very easy to rub one too many times and tear the sign, but I used some of these mistakes to represent old, torn posters.

After I was satisfied that I had gotten the poster as thin as I safely could, I dabbed a little white glue on the back and applied the poster to the wall, purposely curling over some of the corners. **MR**

Keep that car from rolling

Make derails to keep cars in place on a grade

By Olaf Melhouse • Photo by the author

Unlike on the prototype, model railroad cars don't have functioning handbrakes to keep them from rolling away when you set them out on unlevel track. This has happened to me many times while operating on friends' layouts, and I find it frustrating.

On my layout I use homemade derails that work as temporary wheel stops to keep cars in place on unlevel track. Prototype railroads clamp these safety devices to the rail on sidings and spurs to protect the main line. Runaway cars that hit the derail are forced off the track before they reach the main line. My derails don't actually force car wheels off the railhead, but they do keep the cars from rolling away.

My derails are inexpensive to make, and all of the plastic components are cut from Plastruct ABS parts.

Although I designed them to fit on HO track, my derails aren't HO scale. Their larger size makes them easier to handle and sturdy enough for frequent use during operating sessions.

Assemble the base

Start by cutting the two side pieces of $\frac{1}{8}$ " I beams to six HO scale feet long. Then cut each end of the sides at a 45 degree angle so the top edge is four scale feet long. You could use a hobby knife, but I prefer a NorthWest Short Line Chopper for this task.

Next, cut the $\frac{1}{16}$ " H column to four scale feet to make the spacer. Slip the spacer's groove over the top edge of one of the two side pieces and bond it with plastic cement. Attach the other side piece to the spacer the same way. After the cement cures, run a small file through the groove to ensure it will fit over HO rail.

Cut a four-scale-foot long section of $\frac{1}{8}$ " I beam and lay it flat on top of the base. The $\frac{1}{16}$ " spacer should fit inside this top piece. Using plastic cement, glue the top section in place.

Finish the model

To add a staff to the derail, first drill a $.025$ "-diameter hole through the center of the top piece. Cut the staff from a $6\frac{1}{2}$ -scale-foot piece of $.025$ " wire and bend it at a 135-degree angle. Approximately $1\frac{1}{2}$ scale feet of the wire will run through the derail. The remaining five scale feet will extend outward.

Flatten the target end of the staff with a hammer. Use a paper punch to cut the two-scale-foot diameter target from $.015$ " styrene sheet. Use cyanoacrylate adhesive (CA) to secure the staff in the hole on the derail and to bond the target to the staff.

To make the tie catches, which keep the derail from sliding, cut two one-scale-foot pieces of $\frac{1}{16}$ " H column. Cement them onto the lower outside edge of each side piece, positioning each in the middle of the derail.

Finally, cut a one-scale-foot section of a 15-gauge, $1\frac{1}{2}$ " finishing nail to use as a counterweight. Glue the counterweight with CA to the side opposite the target, just above the tie catch. This will allow the derail to sit securely on the rail without falling over.

The last step is to paint and decal the derail. I use gray primer followed by BNSF Ry. orange. Then I apply a dry transfer letter "D" to the target.

Using derails on your layout

Place the derails on the rail down-grade of the cars you want to prevent from rolling. I position the target to the outside of the track so it's easy to grab and remove.

These derails will make your operating sessions more fun and keep your cars right where you want them. **MR**

Olaf Melhouse works for the BNSF Ry. in Fort Worth, Texas. He has been model railroading since 1960. His N scale Dakota Northern RR was featured in the April 2000 Model Railroader.



On the prototype, derails are safety devices that keep runaway cars from causing an accident. Follow Olaf Melhouse as he describes how to make HO scale derails to keep model freight cars from rolling away.

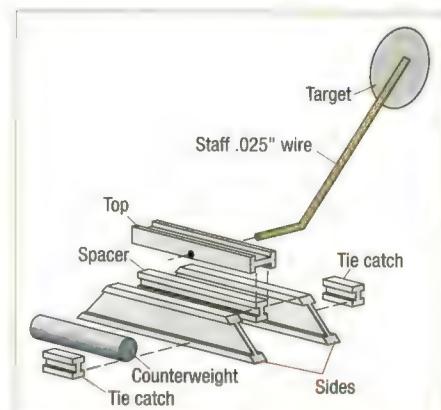


Illustration by Rick Johnson

► Materials List

Plastruct

90023 $\frac{1}{8}$ " I beam
90061 $\frac{1}{16}$ " H column

Miscellaneous

.015" plain styrene sheet
.025"-diameter wire
4D, 15 Ga. $1\frac{1}{2}$ " finishing nail
Plastic cement
Thick cyanoacrylate adhesive (CA)



Restored sibling. Here's a sister to the Fruit Growers Express refrigerator car Harold Russell measured for our drawing. Car no. 57708 was restored to its 1924 appearance by the Railroad Museum of Pennsylvania in Strasburg, Pa.

Fruit Growers reefer

A common prototype built in the 1920s
with a wood body and steel underframe

By Harold W. Russell • Photos by the author

The Fruit Growers Express Co. (FGE) was a railroad-owned refrigerator car company that served shippers in the east and south. It was incorporated on March 18, 1920 as the result of a ruling by the Federal Trade Commission that forced Armour & Co., a meat packer, out of the produce shipping business. The Atlantic Coast Line, Baltimore & Ohio, Pennsylvania,

and Southern were the original stockholders, but by the end of 1920, the Chicago & Eastern Illinois; New York, New Haven & Hartford; and Norfolk & Western also joined the new company.

An effort to expand the firm's business beyond its initial seasonal Florida perishable traffic led FGE into a joint venture with the Great Northern Ry. This partnership in 1923 established

the Western Fruit Express Co. (WFE) to serve the Pacific Northwest region. This provided complementary harvest traffic patterns so FGE and WFE could keep their joint pool of ice bunker refrigerator cars busy year around.

A similar expansion in May 1926 drew the Chicago, Burlington & Quincy into the business and led to the creation of the Burlington Refrigerator Express



Uncoupling lever. This formed steel rod allowed trainmen to uncouple cars without going between them.



Coupler installation. The coupler extends through the striker casting that's riveted to the end sill.



Angle cock. An L-shaped bracket next to the coupler supports the end of the car's air brake pipe and its angle cock.



Ice bunker drain. Salt could be added to lower the temperature. Spouts under each bunker carried the brine away.



Body and truck bolsters. Weight and a vertical kingpin are all that holds the truck in place under the car.



Brake valve. The air brake valve reacts to pressure changes in the train line to operate the car's air brakes.



Brake piping. A system of small pipes transfers pressurized air between the components in the brake system.



Brake system. Most air brake system parts are bolted to steel brackets that are riveted to the underframe.



Brake actuating lever. The brake cylinder (left) actuates steel rods and levers that apply the truck brakes.

Co. (BRE). Another subsidiary of FGE, the National Car Co. (NCC), was established in 1928.

Prior to World War II, the vast majority of the FGE fleet was made up of wood-bodied, ice-bunker refrigerator cars. Each new railroad partner brought more cars into the combined fleet, resulting in an amazing variety. By 1940, the combined firm operated more than 25,000 ice refrigerator cars for 14 railroad owners.

The FGE company operated its major car shop in Alexandria, Va., with smaller operations at Indiana Harbor, Ind., and Jacksonville, Fla.

History of growth

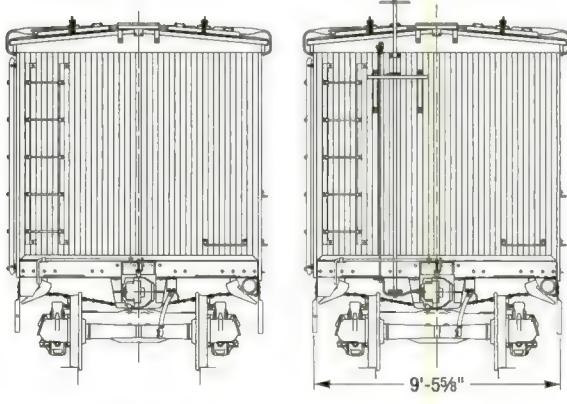
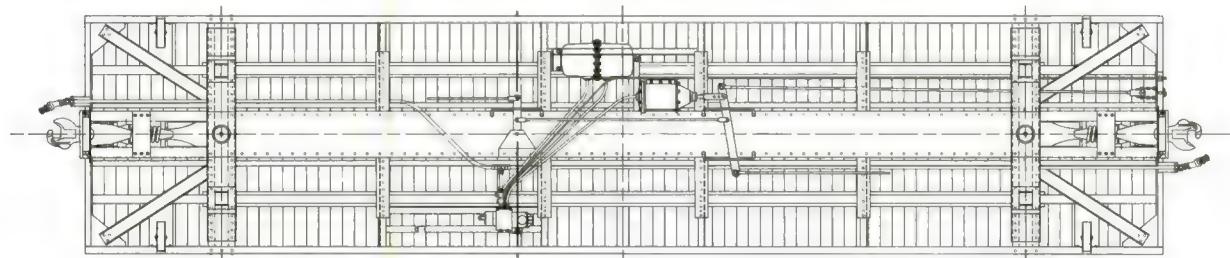
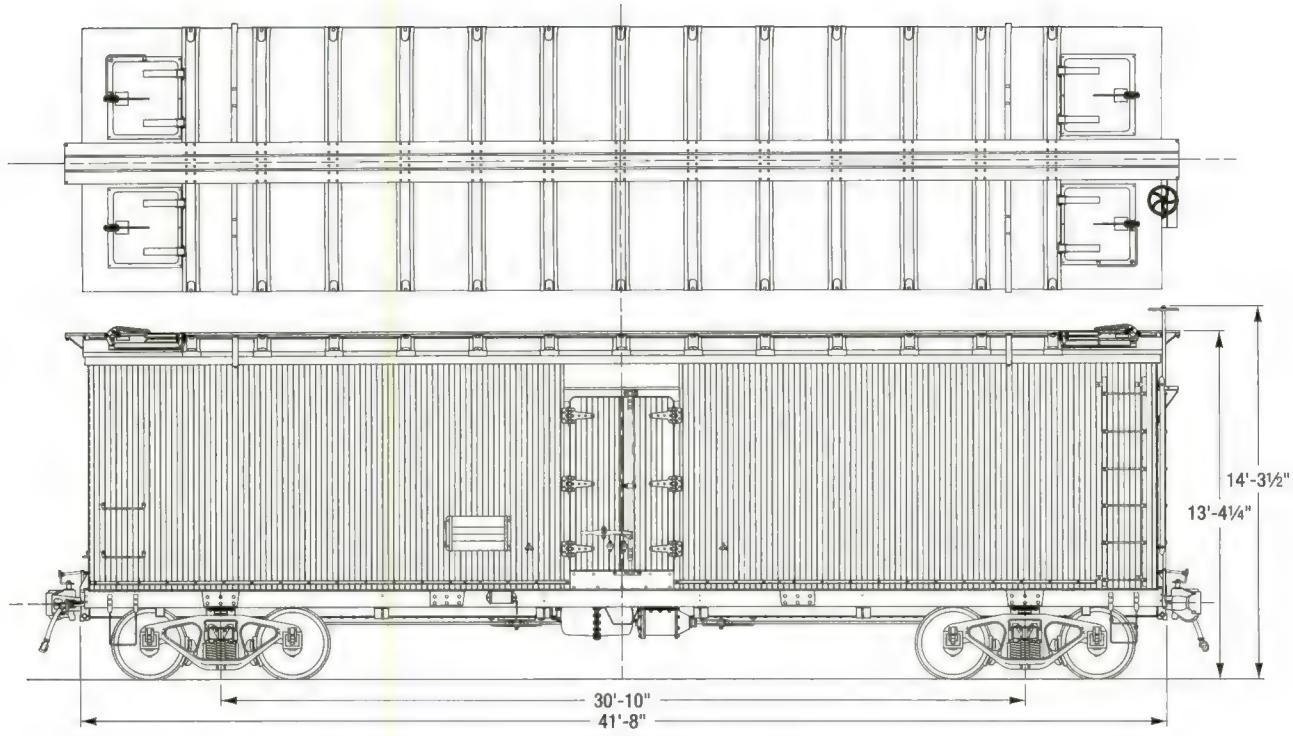
Refrigeration made it possible for meat and produce to reach more lucrative markets on the East Coast, so shippers quickly expanded their perishable traffic. Experiments using ice as a refrigerant began as early as 1857, but by the 1920s, the car design shown here was the most common.

Efficient carbody insulation was the key to a successful refrigerator car. Early designs tried sawdust, charcoal, paper, and rubber sheeting for insulation. The best was found to be felted flax or cattle hair sandwiched into the walls, floor, and roof of a car.

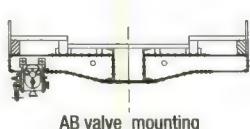
Bunkers at each end held a mixture of ice and salt, and additional ice could be added as needed through the roof hatches. By 1925 the Fruit Growers Express owned more than 18,000 cars.

Refrigerator cars couldn't operate without a system of icing stations along the route. These servicing points and their ice-making equipment were usually owned by the host railroads. Trains handling perishables were carefully scheduled to reach the icing stations before the ice in the cars melted.

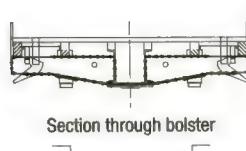
The early private owners operated their car fleets under top-priority service contracts with the railroads.



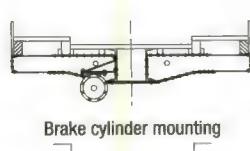
Underframe cross-member



AB valve mounting



Section through bolster



Brake cylinder mounting

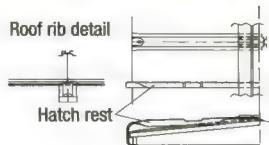
Ratio 1:87, HO scale

TO CONVERT HO SCALE
DRAWINGS TO YOUR SCALE
COPY AT THESE PERCENTAGES:
N 54.4 percent
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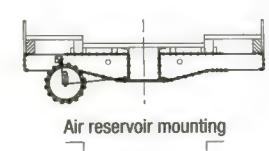
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Roof cross section



Air reservoir mounting

Fruit Growers Express survived the Depression of the 1930s and remained solvent as traffic grew during World War II and peaked in 1946. Unregulated truck competition in the postwar era captured much of the perishable business, so the need for ice refrigerator cars fell rapidly. FGEX switched to steel mechanical reefers and insulated boxcars for the remaining traffic.

Car FGEX 50220

The refrigerator car drawings presented here are based on field measurements of a FGEX 1927-design car that the Fruit Growers Express Co. donated to the Rochester & Genesee Valley Railroad Museum in Industry, N.Y. This museum is operated by the Rochester Chapter of the National Railway Historical Society. Restored sister car FGEX no. 57708 is shown in the opening photo of this story.

Tags found inside car no. 50220 indicate its last revenue trip was in 1968 with a load of bananas. Then the car spent some time parked at FGEX's Niagara Frontier Food Terminal in Buffalo.



Heavy doors. The insulated doors were thick, requiring six heavy-duty hinges to support them.



Rugged latchbar. The long handle provided the leverage needed to close the doors tightly against the seals.



Reinforced doorway. Cam locks at the top and bottom of the doorway helped prevent outside air infiltration.



Riveted assembly. These grab irons and stirrup steps were riveted to the sills. Most of the other underframe parts and mounting brackets were riveted together, but anything that might need to be removed for repair was bolted in place.

There it served as a material storage car for the supplies needed to service other refrigerator cars coming into the terminal. These items included oil for journal bearings, coupler parts, car heaters, and the alcohol to fuel them.

The car had been idle for many years and subject to vandalism (one side was damaged by fire) before it was donated to the museum. Its final movement to the museum was on a lowboy highway trailer.

Interestingly, FGE had installed a metal roof over the original wooden one, and its wood running boards were removed and replaced with stamped

steel parts. It also has drains installed beneath the bunkers at each corner of the car so accumulated ice water could be manually dumped outside of the trucks and track.

This car doesn't have interior ventilator fans like some later refrigerator cars. Instead it simply has vents at the top and bottom of the interior ends to allow the cooled air in the car to circulate through the load and ice bunkers.

The car had standard FGE yellow sides, with black hardware, lettering, underframe, and side sills. The roof and ends were FGE's standard brown with white lettering. According to the



Bolted hardware. Most of the steel hardware was attached to the carbody with bolts to make repairs easier.



Tack board. A tack board on each side and both ends provided places to apply special instruction placards.

April 1968 *Official Railway Equipment Register*, the car was capable of holding 10,600 pounds of crushed ice or 9,600 pounds of block ice. The total capacity of the car was 90,000 pounds, which meant it could carry a 40-ton load.

The R&GV Railroad Museum intends to restore this typical car of the 1920s to its original configuration and FGE paint scheme. **MR**

Harold W. Russell is one of the most prolific draftsmen in the hobby. He has had more than 160 drawings and construction articles published in Model Railroader magazine since 1966.



Keeping true to the **SOO LINE**

Modeling the steam-to-diesel transition era in the Midwest circa 1954

By Mark Preussler • Photos by the author

1. Soo Line RSC-3 no. 2380 brings a way freight past the depot in Dale, Wis., on Mark Preussler's HO scale model railroad. His layout features the Soo Line's Stevens Point Division and Manitowoc Branch. Cody Grivno photo.



Though my hometown railroad was the Chicago & North Western (CNW), I've long been interested in the Soo Line (the Minneapolis, St. Paul & Sault Ste. Marie). Much of this can be linked to a visit to the railroad's Shops Yard in North Fond du Lac, Wis., in the 1970s. Visiting the Soo Line's physical plant was like taking a step back in time. The railroad was still using F units in regular freight service. This, above all else, got me hooked on the Soo. Not long after that visit, I decided to model 1954, when the F units were in their heyday.

With a prototype and period selected, I needed to determine what part of the Soo Line I wanted to re-create. Though the Soo Line lacked the scenic gran-



2. The *Laker* is seen here passing under the telltales near Waupaca, Wis. This Chicago to Duluth, Minn., train is led by FP7 no. 2500.

deur of the Rocky Mountains or the maze of tracks associated with Eastern railroads, it traversed many parts of the Badger State that would be interesting to model.

The Soo had rail-marine operations at the Twin Ports of Duluth, Minn., and Superior, Wis. (iron ore and grain), Ashland, Wis. (iron ore), and Manitowoc, Wis. (Ann Arbor and Chesapeake & Ohio car ferries). The railroad also had street running in Oshkosh, Wis., and a busy yard with a "model size" turntable at Neenah, Wis. The latter was at the western end of the Manitowoc Branch.

As I was deliberating on what part of the Soo Line to model, my wife and I moved into our new house with a large basement. After drafting some track plans, I decided to model the Manitowoc Branch between Neenah Yard and the line's namesake city, plus a portion of the Stevens Point Division. Both of these lines were part of the original Wisconsin Central RR, operating under lease to the MStP&SSM in 1954.

Generating traffic

To generate enough traffic, I included two adjacent visible yards that represent North Fond du Lac (east staging),

Stevens Point (west staging), and other off-layout locations. Each yard has a 100-car capacity.

Between the yards I included the cities of Waupaca, Neenah, and Oshkosh; the town of Dale; and Medina Junction, where the Soo Line crossed the CNW at grade.

As I worked on the track plan, it became apparent that I was designing two layouts, with the branch connecting to the main line via a removable bridge. Each section has its own character, which makes the modeling work more interesting.

The only compromise I had to make was using the Medina Junction area as the "bridge" to the Manitowoc Branch. However, by concealing the tracks at West Neenah with scenery and structures, the branch remains hidden up to the junction. Thus, the layout remains sincere (one scene viewed at a time with each train passing through it only once).

Though I'm building this layout on my own, the track plan has been significantly influenced by others, including the late John Proebsting and Carl Blahnik. John's layout, set in roughly the same period as mine, was in *Great Model Railroads 2002*. I hope some of the scenes on my model railroad will



3. West Neenah is a busy industrial area on the Stevens Point Division. The engineer of NW2 no. 301 is watching the brakeman's hand signals as he prepares to couple onto a pair of loaded boxcars at Reliable Chair Co.



4. West Neenah is home to several rail-served customers. Here, GP7 no. 375 picks up a loaded boxcar at Reliable Chair Co.

eventually be up to John's high level of detail.

Carl's contributions to modeling the Manitowoc Branch are too numerous to mention. Through these two gentlemen I've been able to meet many more modelers who share my passion for prototype modeling.

Track, scenery, and structures

Model railroading shouldn't be a race to the finish, but I feel that when build-

ing a large layout by yourself, the "good enough" factor popularized by Allen McClelland should not be overlooked. With some careful planning and the use of commercial turnouts and track, much progress can be made in a short time.

For example, I used Atlas code 83 flextrack on the main, Micro Engineering code 70 on sidings and the Manitowoc Branch, and code 55 on the branch's sidings. The turnouts, manually operated with Caboose Industries ground

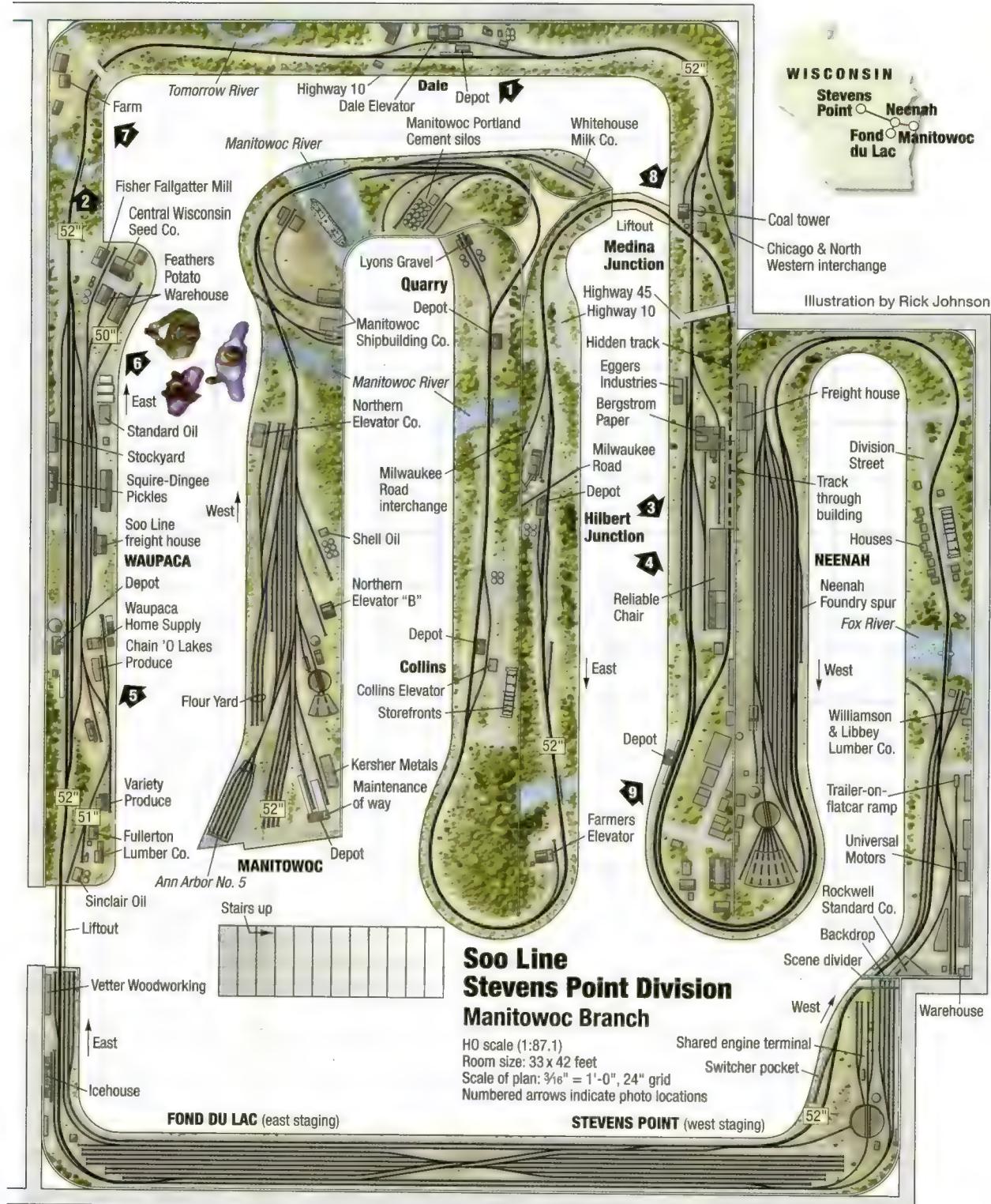
throws, are from Micro Engineering, Atlas, and Shinohara.

Modeling a line that's largely rural also saves time in terms of scenery. I used the tried-and-true method of attaching screen to 1 x 2 wood strips. Then I covered the screen with Structo-Lite from USG, which when dry forms a shell that's almost as hard as cement. The material has a long working time and is fairly cheap. A 50-pound bag sells for about \$15.

Once the Structo-Lite dried, I painted the scenery base with earth-toned flat latex paint and added ground cover from several sources, including Woodland Scenics and Scale Reproductions. I used trees from Scenic Express and Woodland Scenics.

The backdrop is hardboard with a few clouds added for variety. Since I'm not much of an artist, I've found that using blue latex paint with a bit of white blended in near the horizon gives me the effect I'm looking for. I also added a few photos cut out from magazines and calendars to give the backdrop some added depth.

One of the rewarding aspects of this layout has been building structures. I primarily focus on Soo Line's signature structures. I scratchbuild many of these



► The layout at a glance

Name: Soo Line Stevens Point Division and Manitowoc Branch
Scale: HO (1:87.1)
Size: 33 x 42 feet
Prototype: Soo Line
Locale: central Wisconsin
Era: 1954

Style: linear walkaround
Mainline run: 170 feet
Minimum radius: 28" main, 22" branch
Minimum turnout: no. 6 main, no. 5 branch
Maximum grade: 2 percent

Benchwork: L girder and open grid
Height: 50"-52"
Roadbed: cork
Track: codes 83, 70, and 55
Scenery: Structo-Lite over screen
Backdrop: $\frac{1}{8}$ " hardboard
Control: NCE wireless cabs



5. As a freight passes in the background, the conductor from Soo Line GP7 no. 378 flags the crossing while the engineer spots a boxcar at Waupaca Home Supply Co. Though the business name is real, the structure is freelanced.

Transition-era power

The Soo Line had a sizeable fleet of diesels by 1954, so my layout features Electro-Motive Division (EMD) GP7s and early Alco units. Interestingly, many of the Soo's first diesels didn't have m.u. connections, so the railroad invested in matched sets of Alco FAs and EMD F units to power the time freights.

The Soo also seemed to think in terms of specific jobs for specific locomotives, such as RSC-3 no. 2380, which was purchased for the Manitowoc Branch. The unit's weight was distributed over six axles, making it ideal for the light rail on this branch.

I have some steam locomotives, including kitbashed and heavily modified engines and a few Pacific Fast Mail brass imports. Pacifics, Consolidations, and Mikados made up the bulk of the final Soo steam roster, but I have a Mountain and an 0-6-0 for variety. — M.P.

structures and enter them in local National Model Railroad Association model contests before installing them on the layout.

Running the trains

Lately, I've been enjoying operating the railroad. My layout operates best with a crew of eight to 10 people. Using timetables as a guide, I now run 23 trains during a four-hour session with a 6:1 fast clock. This includes the four mainline passenger trains, four time freights, and two daily mixed trains on the Manitowoc Branch. The bulk of the other movements are way freights.

I made the switch to Digital Command Control (DCC) in the mid-1990s. I use DCC components from Wangrow System One and NCE Corp.

The Wangrow dual 5 amp booster is divided so one side powers the main line and staging yards and the other powers Neenah Yard and the Manitowoc Branch. Power to the rails is further regulated using DCC Specialties' Power Shield circuit breakers.

I use NCE radio cabs to run the trains. Since the recent addition of two radio repeaters, I've had no problems

with trains not responding to the throttle commands.

Neenah and Manitowoc

The hub of my layout is Neenah Yard. The switch crew here is kept busy for the entire session making up trains and getting pick-ups ready for the time freights. All cars departing and entering the Manitowoc Branch, and cars destined for local industries as far west as Waupaca, are handled at Neenah.

The real Neenah Yard was built on a curve, with the freight house and roundhouse roughly in the middle of the complex. Since coupling model cars on curves can be difficult, I straightened the yard, which meant I had to move my roundhouse and freight house to opposite ends. Only the lead at the west end of the yard still has a curve. Straightening the yard turned out to be a good compromise, since operators can now easily reach all of the yard, freight house, and roundhouse tracks.

The Manitowoc line at mid-century had plenty of traffic, making it ideal for modeling. On the prototype there were two scheduled mixed trains per day, with a combine carrying the markers.



6. Soo Line 2-8-0 no. 2449 makes its way through the tight confines beside the Feathers Potato Co. warehouses in Waupaca. The town, located in the east-central part of the state, is in the heart of Wisconsin's potato-growing region.

I've added two extras between Manitowoc and Neenah to give my operating sessions a bit more variety.

For those who enjoy switching, there is the Manitowoc Yard job. This yard has three distinct areas: the "flour yard" (named because of its proximity to Northern Elevator and a former flour warehouse), a set of yard tracks near the slip, and the double-ended Boat Yard near the car ferry, *Ann Arbor No. 5*. The yard job also works Whitehouse Milk and Manitowoc Portland Cement. Per the prototype, I included a scale track near the cement company.

The yard crew also works the peninsula, which is home to Manitowoc Shipbuilding. I didn't have enough room to model this industry fully, as its maze of tracks served a massive complex of buildings and dry docks. The railroad spans the Manitowoc River here twice,



7. Train No. 15, the Waupaca Local, rolls through the Wisconsin countryside. Mark used products from Scenic Express and Woodland Scenics to capture the look of the Badger State during the summer.

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This month's free downloadable desktop wallpaper is photo 7 to the right. To get the image, visit our Web site at www.ModelRailroader.com.



once via a bascule bridge and again with a swing bridge.

The yard at Manitowoc includes a turntable, enginehouse, and service tracks. The end of the line is directly across from the car ferry slip, where the track stub ends behind the depot.

Though I've dedicated the peninsula to Manitowoc, I find myself running out of room. I could have used my entire basement to model just the branch and still not had enough space!

Local service

Train No. 15, the Waupaca Local, comes on duty at 2 p.m., which is about halfway through an operating session. Time freights No. 24 and 25 from the previous session have already set out cars for the local. Train No. 46 arrives at Neenah Yard in the early morning and ties up with a small cut of cars from Fond du Lac staging and Oshkosh.

A bit later, train No. 403 arrives in Manitowoc with a few more cars destined for Waupaca. The typical Waupaca Local has 17 cars, so the yard crew must begin to assemble train No. 15 as soon No. 403 arrives. If the crew is familiar with the track assign-

ments at Neenah Yard, No. 15 may already be partially built with the cars from the previous day's 24 and 25.

If all goes well, No. 15 departs Neenah Yard on time, works Waupaca, and then ties up in Stevens Point staging. Cars that were destined eastbound from Waupaca are taken west to Stevens Point staging with No. 15. The cars will later be sent out on the Waupaca Local's counterpart, train No. 16, for classification at Neenah Yard. The cycle repeats with the time freights setting out cars at Neenah Yard for the next session's No. 15.

This scenario applies to all the other way freights, only with different trains supplying cars. Though RailOP for Windows (a PC-based program for developing switch lists) doesn't use virtual waybills, I have a list made up for various customers and related routings. All I have to do is enter the correct movements for the cars.

Along the main line

The Stevens Point and North Fond du Lac staging yards represent the western and eastern ends of my railroad, respectively. I assign switchers to

these locations during operating sessions. The crews assigned to the four time freights, as well as the four passenger trains, use the switchers to break apart their trains when they arrive at the yard. Other crews use the switchers to make up trains as needed.

To get a better feel for the main line, let's hop aboard train No. 26. Leaving Stevens Point staging and heading (railroad) eastbound, we first pass through Waupaca. This agricultural community is noted for potatoes, and several potato warehouses are located here.

Waupaca also has various grain elevators, oil dealers, and lumber yards. The city was served by the Green Bay & Western (GBW) for many years. Its line passed under the Soo's west of the depot. Though the GBW had pulled out of Waupaca by 1954, the Soo purchased portions of its track and connected the lines with its own.

8. Soo Line 2-8-2 no. 1017 is ready to depart Medina Junction after taking on coal and water. The coal tower and water tank are both Walthers models that Mark modified to more closely match Soo Line prototypes.



After passing through the Wisconsin countryside, we come to the town of Dale. The main industries here are a grain elevator and a Skelly Oil dealer, both of which are served via the house track behind the depot.

Next, we cross the CNW at Medina Junction. A coal tower, water tank, and grounded boxcars used for storage are the extent of the Soo's presence here.



Now it's on to West Neenah, home of a bustling rail-served industrial district. Entering Neenah proper, we pass the depot and the yard before we enter another short stretch of open country. Then it's into my freelanced version of Oshkosh via street running down Division Street. Since the real Oshkosh area is too big to model in my space, I selected several of my favorite scenes from the full-size town and compressed or re-arranged them to fit.

After passing over the Fox River, we pass the depot and freight house. During my era, the freight house would be a busy place, as the United States Postal Service loaded bulk mail at this location. Once through Oshkosh, trains pass through a hole in the backdrop to enter the North Fond du Lac staging yard.

Gearing up for 2010

I'm getting the layout ready for the 2010 National Model Railroad Association national convention, which is being held in nearby Milwaukee. I'm finishing the scenery and adding details along the Manitowoc Branch.

Other projects include adding block signals along the Stevens Point Division and acquiring more freight cars. During operating sessions, the yards can become quite empty.

The biggest challenge for 2010 will be finishing *Ann Arbor No. 5*, a railroad car ferry. Fortunately, my friend Don Manlick, an NMRA Master Model Railroader, is an expert shipbuilder and has a museum quality HO scale *Ann Arbor Viking* for me to study.

No matter how far I get by 2010, I'm having a lot of fun running trains and



Meet Mark Preussler

Like many model railroaders, Mark Preussler became interested in the hobby with Lionel trains. He started modeling in HO scale at age 10 with his father, Merlin, and younger brother, Marvin.

Mark has worked in the graphic arts industry for 22 years and also operates his own Web site, www.marksmodelrailroading.com, which has additional photos of his layout and model railroading tips.

When not working on his Soo Line layout, Mark and his wife, Michelle, enjoy biking, attending sporting events, and spending time with family and friends.

sharing my layout with others. My operating crew includes Joe Degroot, Dale Krueger, Don Manlick, Ivan VerGowe, and my brother, Marvin. These five talented model railroaders deserve a lot of credit for their assistance with this layout, and for helping me keep true to the Soo Line. **MR**



9. As train No. 18, the *Laker*, pulls up to the platform at Neenah, the fireman from Alco RSC-3 no. 2380 walks toward the depot for his lunch break. Once the *Laker* departs, the freight train can enter Neenah Yard.



A double-deck New England track plan in N scale

This 12 x 16-foot walk-in layout represents Maine Central in the White Mountains of New Hampshire

By John Koukol Jr.

My plan for the N scale White Mountain Division represents the western end of the Maine Central's Mountain Subdivision that ran from Portland, Maine, to St. Johnsbury, Vt. This prototype subdivision is probably best known for its dramatic 14-mile run through the White Mountains to

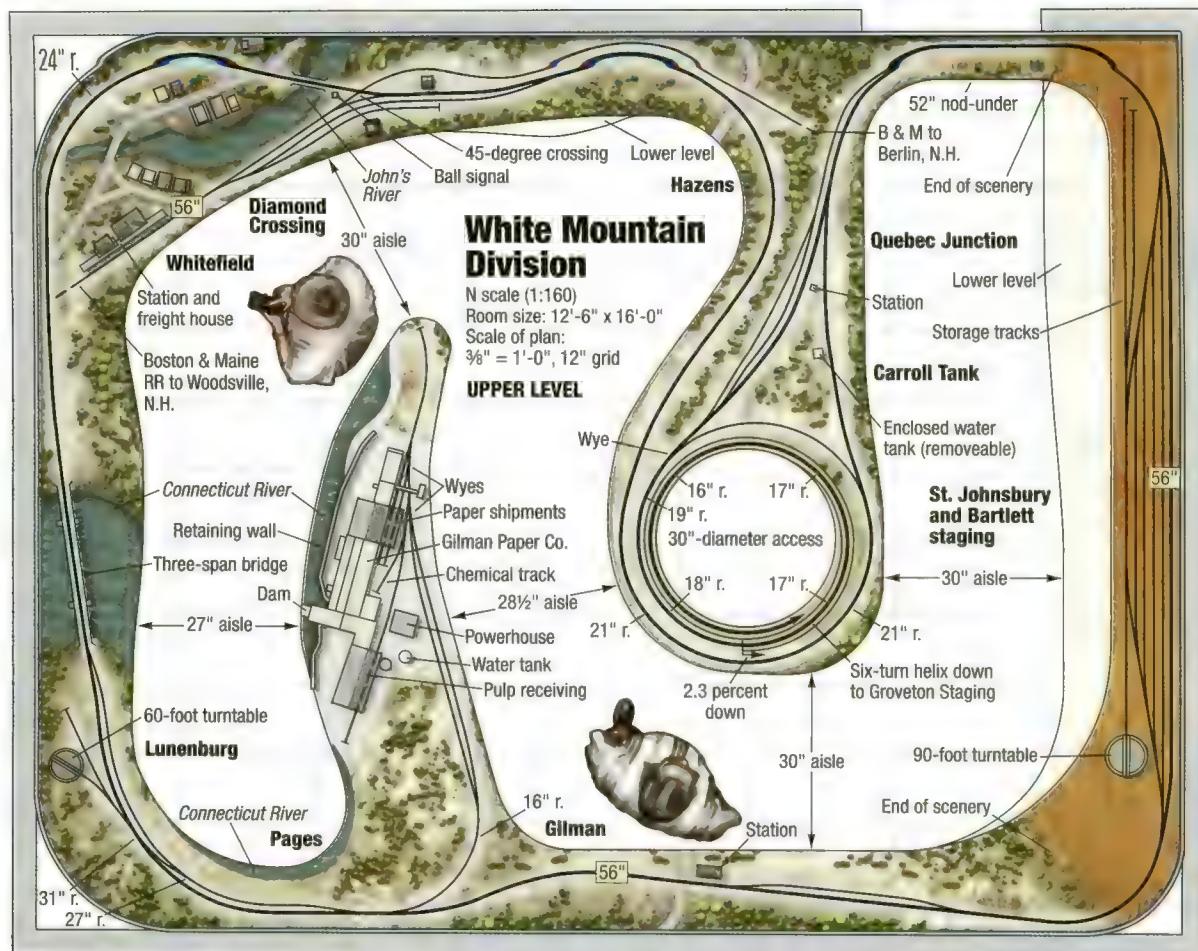
Crawford Notch. Westbound trains battled an average grade of 2.2 percent for much of the climb out of Bartlett, N.H. For local freights working to the west of Bartlett, the real struggle was on the other side of the Notch.

Much of this action took place on the Beecher Falls branch. The branch connected with the main line at Quebec

Local freight no. 377, with a milk car for passenger train no. 163, pulls into Quebec Junction in August 1957. The junction is at the top of the helix on John Koukol's plan. Photo by Bill Gale, courtesy of the 470 Railroad Club collection

► The track plan at a glance

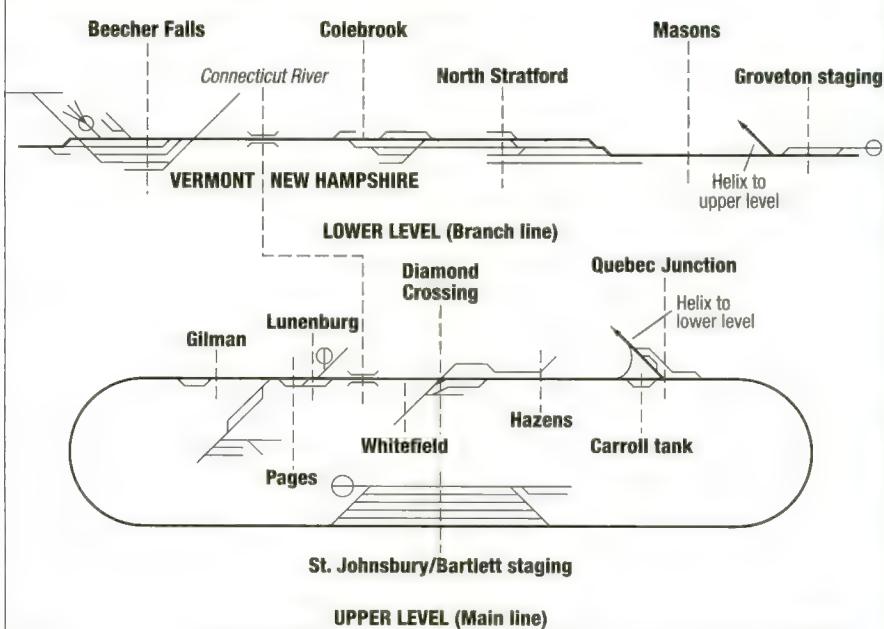
Name: The White Mountain Division
Scale: N (1:160)
Size: 12'-6" x 16'-0"
Prototype: Maine Central
Locale: Northern New Hampshire and northern Vermont
Era: early fall 1949 to early fall 1960
Style: two-level, walk-in
Mainline run: 69 feet
Minimum radius: 16"
Minimum turnout: no. 6, except where indicated
Maximum grade: 2.3 percent



Illustrations by Theo Cobb



White Mountain Division schematic



Junction, N.H., 100 miles west of Portland, Me., and followed the upper Connecticut River valley 55 miles north to the Canadian border at Beecher Falls, Vt. It originally continued farther north, but the right of way in Quebec was abandoned in 1925. Another section of the branch was abandoned in 1949, requiring local freights to travel portions of the route over the Boston & Maine and Grand Trunk RRs. The last of the branch was abandoned in 1977.

I designed this track plan for the White Mountain Division with the objective of re-creating way freight operations west of Crawford Notch, including the upper end of the branch. To aid my design, I first drafted the list of primary goals shown on the next page. With those goals in mind, I developed the White Mountain as a two-level walk-in scheme that fits into a vacant corner of a basement. The four interior walls were added specifically to help support the layout.

Tour the track plan

Beecher Falls, which is on the plan's lower level, marks the end of the branch. The small terminal relies on business from pulpwood loads and the large furniture plant north of the yard.

At Beecher Falls, the prototype yard included three double-ended tracks and several spurs. The engine terminal had a 55-foot turntable, a three-stall engine house (which the railroad reduced to one stall in the early 1950s) and an enclosed octagonal water tank. The coaling station was little more than a gondola and a shovel.

Ten miles to the south of Beecher Falls is the town of Colebrook, N.H. It was one of the busiest stops on the branch, with three creameries, two oil dealers, a coal dealer, a feed store, a potato warehouse, and farm supplies, plus pulpwood, less-than-carload lot freight, and passengers. Most of these customers are included on the layout.

Like Beecher Falls, the Colebrook yard is linear in design. The passing siding is long enough for two 12-car trains to meet here. The model yard has one more track than the prototype to help replace a second small yard north of the station. The added siding provides a runaround that eases congestion while working the yard.

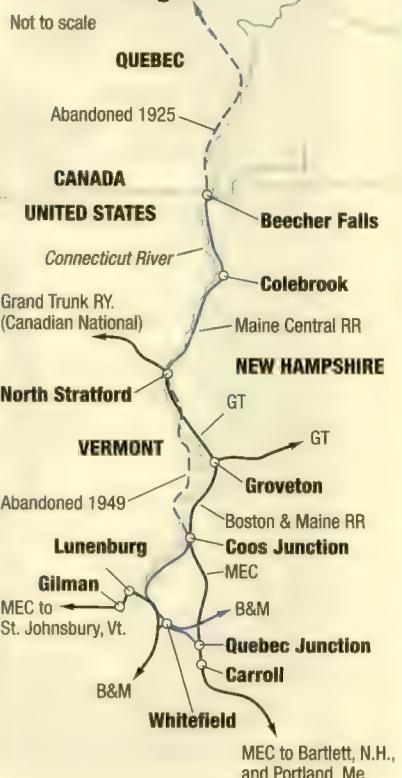
Onto the Grand Trunk main line

Farther to the south is North Stratford, N.H. Here the track arrangement veers from the straight and narrow as the branch rounds a bend into a small S shaped interchange yard, before switching onto the GT's main line. Several non-operating tracks have been included to represent the prototype scene.

North Stratford wasn't part of earlier plans, and fitting it in pushed Quebec Junction off the wall onto a peninsula. But it was well worth it, as the interchange with the GT provides an increased number and variety of cars moving over the branch.

Moving south past the abandoned MEC crossing at Masons, the track heads for the staging area at Groveton, N.H. Groveton is the changeover point between the GT and the B&M rights-of-way. As on the prototype, trains must

Maine Central Mountain Subdivision Western segment



be turned here. The yard is used as a layover point for trains while they're presumed to be working the unmodeled southern end of the branch. It also provides staging so that either level can be operated as a stand-alone layout.

Southbound trains out of Groveton climb the helix to the upper level and pull into Quebec Junction. The broad curves of the branch line and main line flow together to form two long legs of the wye. The small shanty stands quietly at the once-busy junction, but there's still plenty to do when three trains meet here to exchange cars.

Main staging yard

East of Quebec Junction, the main line crosses the layout's entryway on a duckunder section that leads to the mainline staging yard. I had hoped to add a reversing loop with staging at each end of the main line, but I simply ran out of space. I abandoned the reversing loop in favor of a continuous loop with shared east/west staging.

Carroll Tank siding is situated along the mainline leg of the wye. The real Carroll Tank was approximately 2 miles east of the junction, but the added operation justifies this geographical inaccuracy. Combining key features from two or more nearby prototype locations

into a single model location is a space-saving way to expand the scope of the layout without expending real estate.

Just beyond Quebec Junction, the Boston & Maine's Berlin, N.H., branch merges with the Maine Central right-of-way and parallels the main line from Hazens to Whitefield, N.H. The picturesque town of Whitefield provides the backdrop for the interchange at Diamond Crossing. The crossing was one of six junctions between the MEC and the B&M in New Hampshire, and the White Mountain Division wouldn't be complete without at least one of them. Local MEC passenger trains had to switch onto the B&M track at the crossing to reach the joint station. The location is also known for having had the last operating ball signal in the United States.

Continuing further west, the main line crosses into Vermont on a three-span wooden covered bridge. The real bridge was replaced with a steel truss in 1928, but the president of the White Mountain Division was able to preserve the N scale version of the sturdy bridge for another 22 years. It was finally replaced in 1951 when diesels first appeared on the line. The bridge remained open during reconstruction, making for an interesting model. The altered history provides the opportunity to model three versions of the bridge as time progresses from 1949 to 1960.

The curved siding beyond the bridge represents Lunenburg, Vt., at the east end, and Pages at the west end. Connecting sidings that are only a couple of miles apart is another example of combining features from two nearby prototype locations.

The Lunenburg end of the siding was used for cars that were set out and picked up by through freights. By the 1950s, two spurs and an old turntable were the only remnant of the engine terminal and yard. The spurs were used for maintenance-of-way storage, while the turntable was seldom used. It could be built as a static model or omitted entirely without affecting operations.

The Pages end of the siding at Gilman was the turning point for local freights originating from the east. Gilman Paper Co. was a finishing mill that received boxcars of pulp from the interchange at North Stratford.

More on our Web site

Read John's compiled timeline (1949 to 1969) of motive power assignments on the MEC's Mountain Subdivision at www.modelrailroader.com.

White Mountain Subdivision design goals

Primary goals:

1. Include the Beecher Falls terminal, Quebec Junction, and at least one other town along the branch.
2. Include enough visible main line to interchange with the branch and run a variety of trains through Quebec Junction.
3. Include enough staging to handle several mainline trains, including one long through freight in each direction.
4. Accurately model prototype locations and operations.
5. Consist of a series of scenes with the right of way passing through each scene only once.
6. Depict the passage of time from the late 1940s to the early 1960s.

I took advantage of the remaining open space in the center of the layout to locate the mill on a peninsula. This creates a centerpiece that can be accessed from all sides. I had to make some adjustments to the lower level so that the operating point at Colebrook wasn't directly beneath the peninsula.

The west end staging yard represents St. Johnsbury, Vt., where the MEC connected with the Canadian Pacific and the St. Johnsbury & Lamoille County railroads. This is the end of the line for westbound through freights. The motive power from the morning freight will wait in the yard for the return trip on the eastbound freight later in the day. Local passenger train No. 162 also has to be turned here for its return to Portland as train No. 163.

Suggesting an era

After deciding the region my plan would cover, I turned my attention to considering which era to model. The inclusion of two water tanks suggests that the layout is set in the steam era. However, the tanks are removable, providing the flexibility to model the passage of time from the last days of steam into the early diesel age. Adding this dimension is another way to extend the scope of the layout without ever expanding its size.

Fortunately, only minor changes are required for the layout's setting to represent any year from the late 1940s to the early '60s. The passage of time can be accomplished by removing water tanks, replacing the three-stall engine house at Beecher Falls with the one-stall version, using tank cars in place of coal gondolas for fuel, and changing the bridge at Lunenburg. Beyond that, replacing a few vehicles is all that's required to shift the period.

The variety of motive power and operating schemes that can be modeled during this period of time is equally

interesting. Fortunately, there's a fairly complete selection of Maine Central locomotives, rolling stock, and decals available in N scale.

Attained goals

With the aid of my prioritized list of goals, I've designed a mid-sized N scale railroad that offers a variety of trains, operating schemes, and modeling options. It's an ambitious undertaking, but it lends itself to constructing a town at a time. I'll pick the year 1953, start at Beecher Falls, and expand from there, which will give me a variety of modeling projects from which to choose.

Who knows if the White Mountain Division will ever reach St. Johnsbury. Nevertheless, the layout should provide years of enjoyment before it follows its prototype into abandonment. **MR**



Meet John Koukol Jr.

John is an instrument engineer in the process control industry. He lives in North Attleboro, Mass., with his wife, Pat, and their three children, Chris, Kara, and Tracy. John has enjoyed model trains since birth, as his father has sold and repaired toy trains for more than 50 years. When he's not involved in model railroading, John also enjoys reading and playing golf.



Updating an Amtrak F40PH for the 1990s

Easy detail modifications bring a Walthers HO model into the next decade of passenger service

By Matt Snell • Photos by the author

Electro-Motive Division's F40PH was Amtrak's primary intercity passenger locomotive for more than 20 years, and during that time it became a favorite among model railroaders. Models of the F40PH have been produced in HO, N, and O scales that represent the as-built locomotives.

Walthers offers a moderately priced Trainline model that comes factory finished in two Amtrak paint schemes, as well as some of the other owners' colors. This Trainline model is a good-looking

basic F40PH, but it lacks separately applied details compared to other models. However, the plain carbody makes the unit easy to customize.

When a friend asked me to detail his Amtrak model, I realized that I had only a minimal knowledge of recent full-size passenger equipment. Detailing the Walthers model proved to be a learning experience and an enjoyable project that was quite a change from my seemingly endless stream of big, six-axle freight locomotives.

Matt Snell detailed this Walthers HO model to represent an Amtrak F40PH locomotive that had been upgraded and repainted during its long career.

Front end modifications

I started with a factory-decorated model in Amtrak's mid-to-late 1990s Phase IV paint scheme. I compared the F40PH model to my reference photos, and the lack of ditch lights was immediately apparent.

Ditch lights are high-intensity lights that are mounted about four feet above the rails to attract attention to a moving train. They flash alternately when the horn is sounded. Amtrak refitted its F40PHs with ditch lights to comply with a federal mandate that took effect in 1998. The lights were mounted on the front of the hood on some units, while on others they were installed in recessed notches cut into the lower front corners as shown in **fig. 1**. I decided to model the recessed version.

Modeling the recesses for the ditch lights required cutting rectangular panels into the shell. I disassembled the model and used the time-tested method of drilling out the four corners of a rectangle and connecting the holes. I began by drawing the rectangles on the body shell in pencil and then drilling a small hole at each corner. Then I placed a straight edge on the shell and scored lines between each of the holes with a no. 11 blade, marking the rectangle. Using the marks as guides, I repeatedly

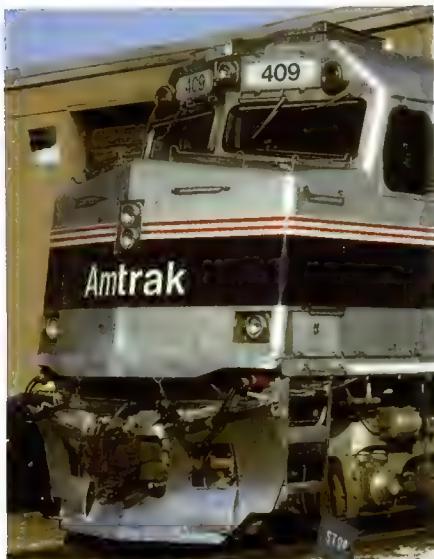


Fig. 1 Ditch lights. The modifications made to accommodate the ditch lights are apparent on Amtrak no. 409, seen here in Chicago on October 21, 2000.

John G. Benson photo

scored over each mark until the rectangle was cut out.

A little careful work with a small square file left a clean rectangle that I backed with a small square of thin sheet styrene that wouldn't interfere with the frame. Then I cemented a pair of Detail Associates ditch light castings into the openings with cyanoacrylate adhesive (CA). See **fig. 2**.

After touching up the paint, I began installing working ditch lights using LEDs (light-emitting diodes). I drilled through each ditch-light casting and cemented the LEDs into the castings. If you're not interested in having operating ditch lights, cement M.V. Products no. 25 clear lenses in the openings.

Carbody detail additions

I carefully removed the snowplow so I could add a Detail Associates uncoupling lever. I drilled four no. 80 holes in the pilot for the eye bolts that support the uncoupling lever and secured each one with a drop of CA.

Next, I drilled no. 74 holes in the front and rear pilots for a set of Detail Associates m.u. hoses. I threaded the hoses through the openings in the plow as I reinstalled it on the pilot.

A pair of horizontal grab irons flank the headlight on the front of the nose. I carefully marked the outer locations of each grab iron and drilled a no. 80 hole in each spot. I cut one leg short on a pair of Detail Associates no. 6602 grab irons and slipped the long legs into the holes. I used the short legs to mark the locations and drilled the second hole for each grab iron so I could



Fig. 2 Cutting recesses. Matt cut rectangular holes into the corners of the nose and backed them with thin styrene to make the recessed openings for the ditch lights. On some units, the ditch lights were mounted on the front of the hood.

Historic background

As Amtrak took over North American passenger services in May 1971, the new carrier faced many challenges. One of its biggest problems was a fleet of high-mileage passenger locomotives that were no longer reliable enough for regular service.

General Motors Electro-Motive Division (EMD) developed the F40PH to replace these aging veterans. Later production units, starting with no. 230, received larger fuel tanks for increased range and went on to become Amtrak's primary passenger locomotive of the late 20th century. Based on the proven GP40 freight locomotive, this 1976 design had a fully enclosed carbody, a 3,000-hp, 16-cylinder diesel engine, and was capable of speeds up to 103 mph. The later units included greater fuel capacity and additional head-end electrical power (HEP) capability to operate the new passenger cars.

In all, 210 F40PHs were constructed for Amtrak between 1976 and 1989, and they operated nationwide outside of the electrified Northeast Corridor.

During their years of Amtrak service, most of the F40PHs were rebuilt at least once. They also received multiple external modifications ranging from new paint schemes to safety mandates such as ditch lights and relocated air horns.

After traveling millions of miles for more than 20 years, the F40PHs were retired by Amtrak. However some of these locomotives live on in Amtrak service as unpowered cab control cars, power for commuter railroads, and in private ownership. A few have even been rebuilt by freight railroads for use on occasional special passenger movements and to haul executive trains. — M.S.

finish the installation and secure both grab irons with drops of CA applied from the inside. All of these details can be seen in **fig. 2**.

My next step was to drill more holes to add the uncoupling lever, eye bolts, and m.u. hoses to the rear pilot. See **fig. 3** on the next page. Then I added

five no. 2202 grab irons to make the roof access ladder on the left side. I also installed the single grab iron to the right of the doorway. All of these locations are marked with tiny indentations in the body shell.

Prototype photos show the unit has a series of four grab irons on each side

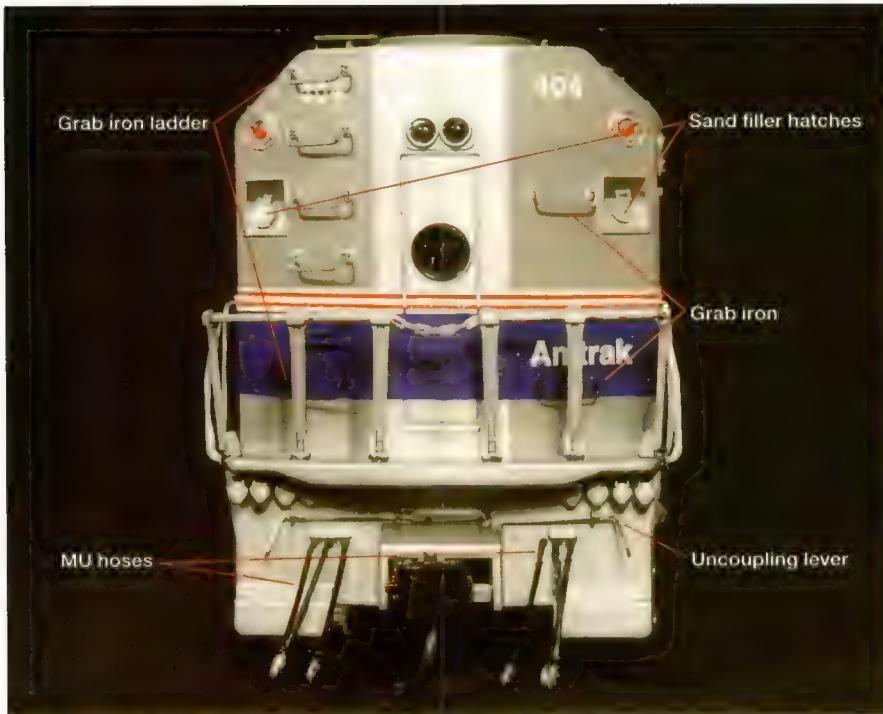


Fig. 3 Rear details. Adding the grab irons, m.u. hoses, and uncoupling lever turns the Spartan model into a more realistic looking HO locomotive.



Fig. 4 Careful work. If you work carefully to preserve the original paint, the new detail parts can be easily brush-painted so that they blend right in.

that provide access to the top of the nose. Using the molded nut-bolt-washer details as guides, I located and drilled no. 80 holes for the ladder grabs.

Then I followed the same method to install Detail Associates no. 2202 grab irons on each side of the shell. I painted these parts with Floquil Platinum Mist and Dark Blue as appropriate to match the colors used on the Walthers model, as shown in **fig. 4**.

The model also needs the long vertical grab irons at the cab and engine room doors and rear corners. I made

these from .015" diameter steel wire. I drilled no. 79 mounting holes, bent a length of wire at a right angle, and inserted it into the first hole. Holding the wire with needlenose pliers, I trimmed the length and made the second bend so I could insert the end into the second hole. Then I secured the long grab irons with CA applied from inside.

Recessed cutouts are provided for the sand fillers, but the filler caps were omitted. I installed Detail Associates GP35 sand filler caps in holes I drilled for them.

► Materials list

Walthers

931-335 Amtrak F40PH,
Phase IV scheme

BLMA

88 36" fan

Detail Associates

1013 ditch lights
1508 m.u. hoses
2202 drop grabs
2204 uncoupling lever
2206 eye bolts
2215 ladder grab iron
2309 air conditioner
3001 GP35 sand filler
6602 grab iron

Details West

235 Sinclair antenna
252 Nathan K5 air horn

K&S Engineering

498 - music wire .015" diameter

Rooftop fittings

The most viewed part of a model is usually its roof, and the top of a modified Amtrak F40PH has many interesting details, including a cab air conditioner, grab irons, air horns, lift rings, and a radio antenna.

Beginning with the top of the nose, I added Detail Associates no. 2215 ladder grab irons placing two at the front of the nose, and one on each side. Once again the shell was lacking sand filler covers, so I drilled holes at both corners for two EMD sand filler caps.

In an effort to reduce the noise level in the cab, Amtrak relocated the horns on some locomotives from the cab roof to the center of the hood, just behind the exhaust stack. Since I had already planned to replace the original plastic horn with a brass casting, I cemented the plastic horn in place and then trimmed it off flush with the recess in the cab roof to fill the old mounting hole. Then I mounted an appropriate Details West Nathan K5 horn behind the exhaust stack. See **fig. 5** on the opposite page.

The next major feature I wanted to add was an air conditioner on top of the cab. Unfortunately, there's no casting available for the Amtrak-style air conditioner. But, I was able to make one from a Detail Associates no. 2309 air conditioner and a BLMA no. 88 N scale 36" fan.

I sanded the raised molded grating from the top of the air conditioner

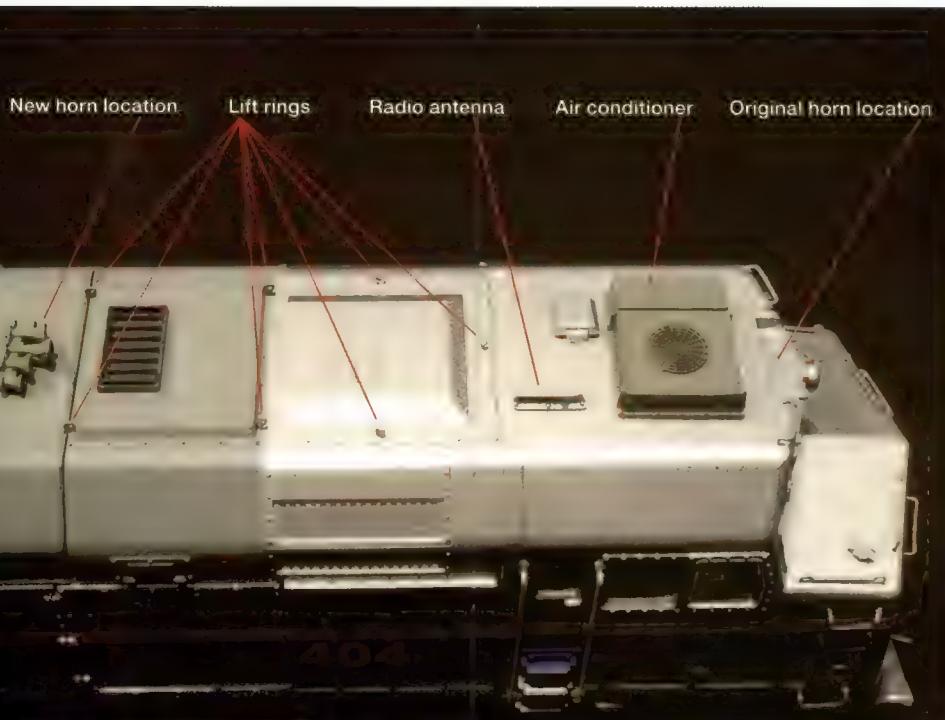


Fig. 5 Roof details. Matt moved the five-chime horns to the middle of the roof and added an air conditioner, lift rings, and a radio antenna.

casting and then painted it a dark gray. I carefully cemented the thin metal BLMA grating onto the flat surface on the top of the air conditioner with CA and then attached the assembly to the cab roof.

To complete the roof, I installed a Details West Sinclair antenna on the right side behind the air conditioner and added two grab irons along the front edge above the number boards.

The long hood roof was lacking lift rings, so I added Detail Associates metal eye bolts as lift rings. I installed them in all of the molded dimples and a few additional locations to match prototype photographs. I aligned the single grab iron on the rear of the hood with the ladder on the rear wall.

An amazing transformation

My last step was to brush-paint all of the new detail parts to match the locomotive's colors using Floquil Platinum Mist, SP Lettering Gray, and Dark Blue. This touch-up produced an immediate improvement in the appearance of the model and certainly made the minimal amount of time and work well worth the effort.

In a few hours, I had transformed an inexpensive locomotive that was spare on details into a much more realistic model suitable for service alongside any of my high-end freight locomotives. From now on I'll be looking at such models as great starting points for future projects. **MR**

Prototype research

I always begin any prototype modeling project with some basic photographic research to see the details I need to add. A number of high-quality Amtrak roster and equipment photo galleries can be found on the Internet, including:

- Amtrak photo archives: hebners.net/amtrak/
- Amtrak rosters: www.on-track-on-line.com/amtrak-roster.shtml
- Fallen Flags Railroad Photos: www.rr-fallenflags.org/amtk/amtk.html
- LocoPhotos: locophotos.com
- RailPictures.net
- Railroad Picture Archives: www.rrpicturearchives.net/locoList.aspx?id=AMTK

In addition, I made a visit to the Morristown & Erie Ry. After receiving permission from the railroad, I was able to make a close inspection and take photos of Maine Eastern no. 265 (former Amtrak F40PH no. 265). — M.S.

Matt Snell is a prolific HO modeler whose 24 x 40-foot Conrail New Jersey Division layout was featured in Great Model Railroads 2006. He and his wife, Debie Baker, are avid railfans who live in Milford, Ohio.

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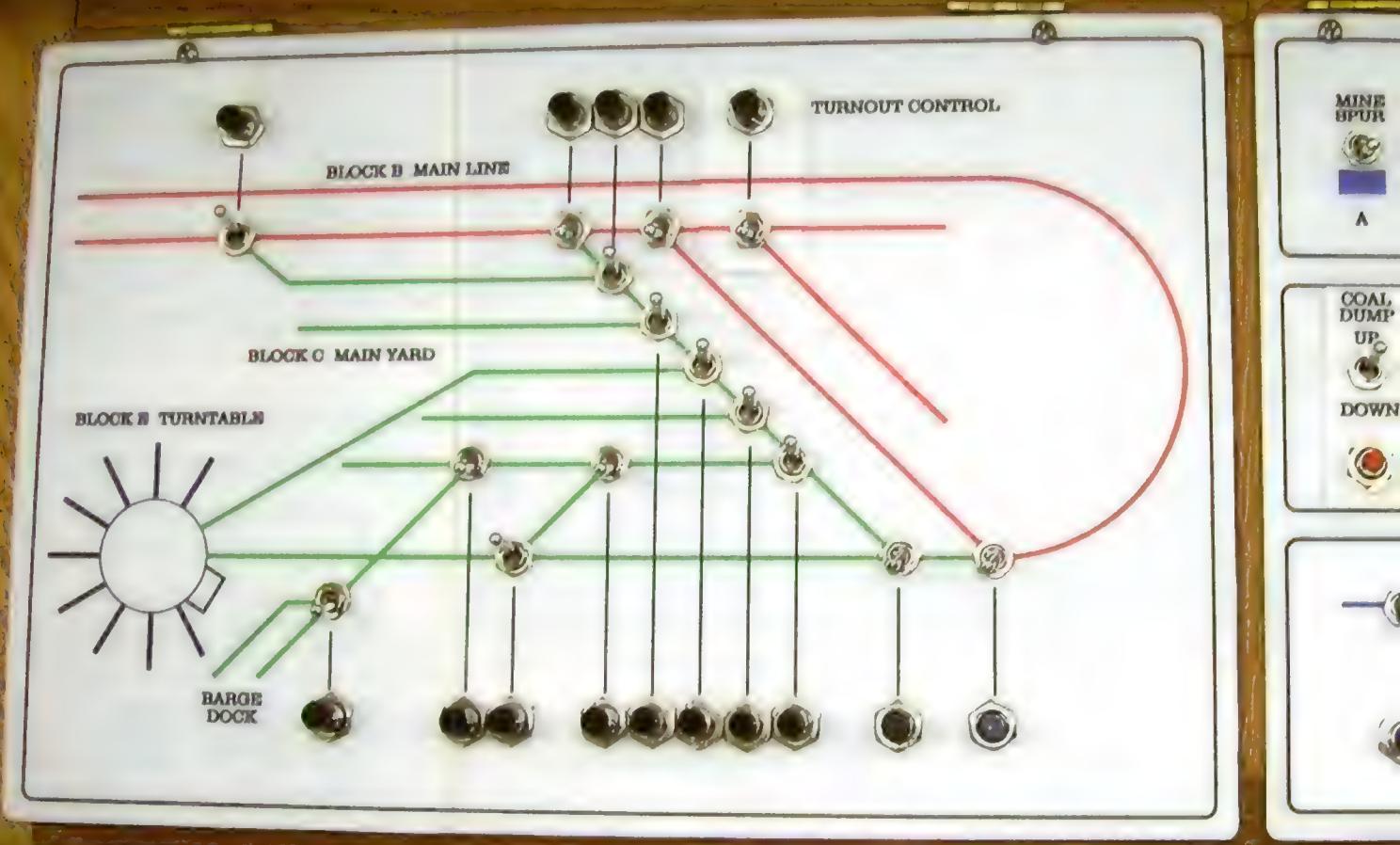
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Wayne McNab uses professional-looking control panels to make running trains easier for operators on his model railroad. Follow along as Wayne shows you how to make these laminated, wear-resistant control panels.

Easy layout control panels

How to add neatly drawn track schematics to your model railroad

By Wayne McNab
Photos by the author

Control panels let operators on your railroad see the track schematic and easily identify turnout toggle switches.

I've used electrical tape and printed-circuit board tape for track schematics on control panels, with crude-looking results. Then I developed a method for making neatly drawn laminated control panels for my model railroad.

Draw the track schematic

I draw the track schematic on my home computer using AutoCad. Other

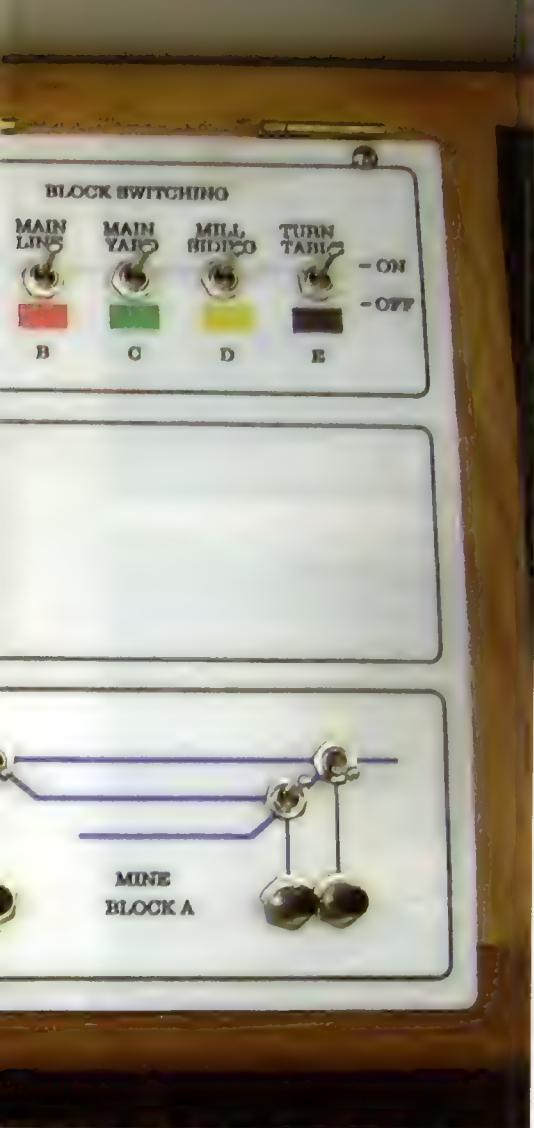
graphics software, such as Corel Draw, also works well. Free simplified drawing software is available as a download at www.openoffice.org.

Whatever program you use, take the time to make sure that the track schematic is neat and easy to follow. Even free graphics programs will give you many options for color coding or labeling tracks. You should also mark the locations of any push buttons or toggle switches that you plan to install.

After I finish the track schematic, I print a copy on plain white paper, as shown in **fig. 1**. That way I can make sure that I've sized the diagram correctly and can adjust it on my computer if needed.

Drill the metal base

I use .063" thick aluminum sheet for the control panel base. Aluminum is easier to work with than steel, and most metal suppliers can cut sheets to a particular size for you.



► Materials list

Avery
5165 8½" x 11" label stock

MetalsDepot
www.metalsdepot.com
S3063-5052 .063" aluminum sheet

Miscellaneous
.010" polycarbonate or mylar sheet
3M Super 77 spray adhesive

It's important to drill the holes for the push buttons and toggle switches in the metal plate before attaching the label and its laminate sheet. If you drill through the finished panel, there's a good chance the label will peel away from the base or tear.

I print an extra plain-paper copy of my track schematic and use that as a drilling template. Always wear eye protection when drilling or cutting metal. Once all the holes are drilled I use a file to clean up any burrs. The base shown

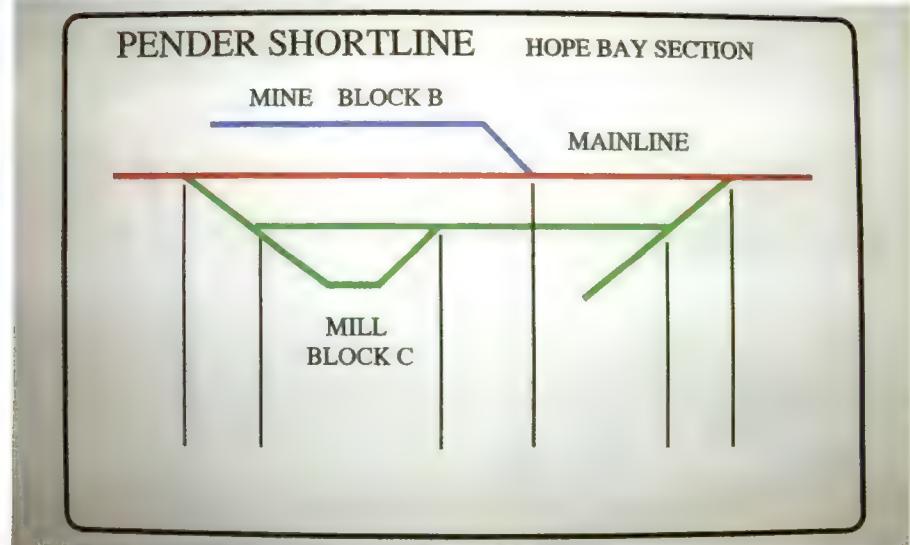


Fig. 1 Drawing the track schematic. Wayne draws the track schematic on his home computer using AutoCad and sizes it to fit his control panel. You can use any graphics program that's convenient for you.



Fig. 2 Drill the metal base. Using a paper template, Wayne drills holes in the base for switches and push buttons. The base is made of .063" aluminum sheet.

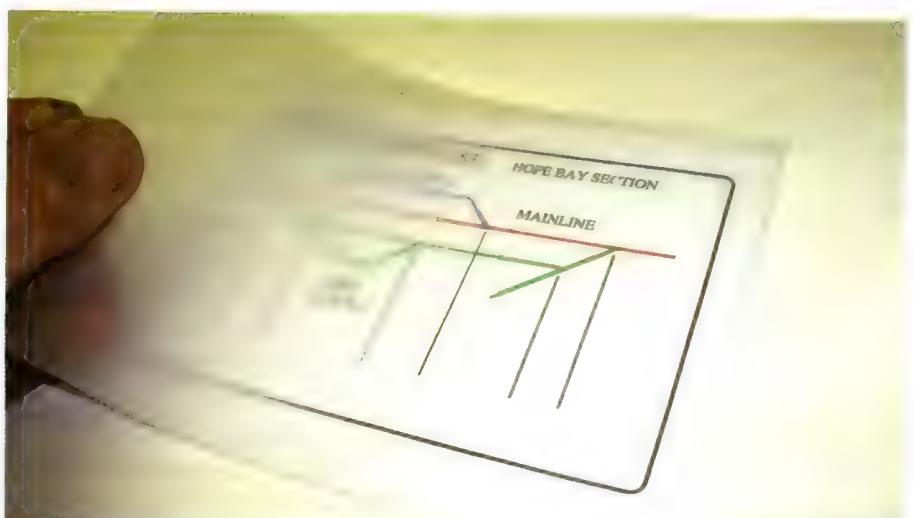


Fig. 3 Laminate the schematic. Once the schematic is printed on label stock, Wayne laminates it with .010" Lexan sheet.

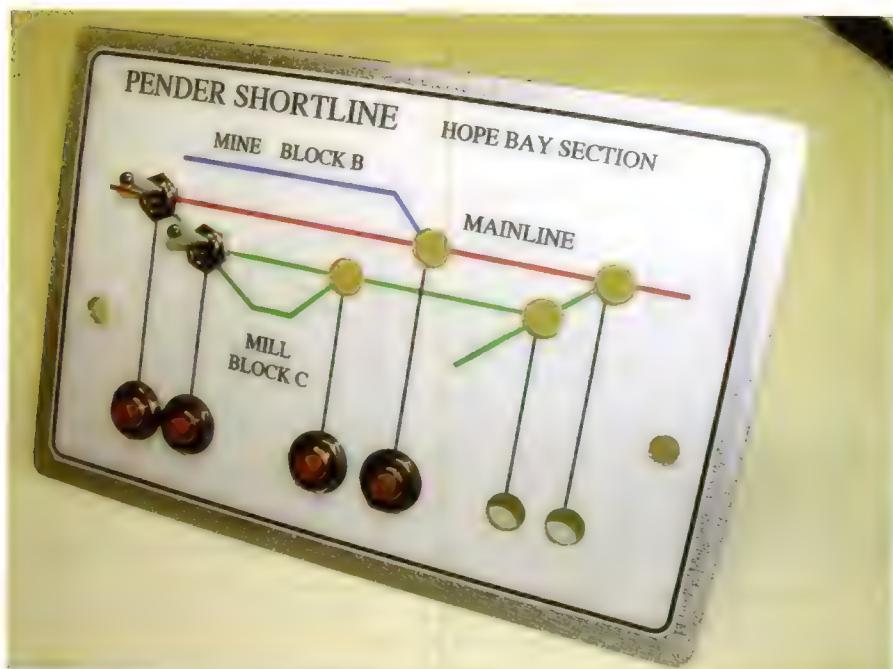


Fig. 4 Finish the panel. With the laminated track schematic attached to the metal base and the holes cut out, it's time to install and wire the switches and push buttons. Then the panel can be mounted to the layout.

in **fig. 2** is ready to have the track diagram attached to it.

Labels and plastic film

I print the final track schematic onto an 8½" x 11" sheet of Avery label stock, which has an adhesive backing on one side. This paper will work with home computer printers and is available in most office supply stores. I use a hobby knife and metal straightedge to trim away the excess paper, leaving an extra ¼" border around the track schematic.

Next I laminate the label with a .010" Lexan (polycarbonate) sheet. You can buy Lexan from plastics suppliers. You could also use a mylar sheet, which is available at art supply stores. Whatever material you use, make sure that it has a matte finish on one side, often referred to as a "velvet finish."

Using a hobby knife, I cut the Lexan sheet slightly larger than the trimmed label. Then I lay the Lexan sheet matte side down and spray the shiny side with spray adhesive.

Next, I place the track schematic, drawing side up, on a flat and smooth surface. As you can see in **fig. 3** on page 63, I start at one end of the schematic and lay the Lexan sheet over it, adhesive side down. I smooth out any air bubbles that are trapped between the two sheets with my fingers. A small roller is also useful for this step.

Mounting the schematic

Using a hobby knife and a straightedge, I cut out the laminated schematic

to fit the metal base. After checking the fit, I remove the backing from the adhesive side of the label paper. Starting from one end, I attach the label and smooth out any air bubbles.

I make sure that the holes in the laminated track schematic line up with the holes I drilled in the metal base. I've found that it helps to place a light behind the metal base while you stick the label onto the front. The light will shine through the holes in the base so that you can see them from the front of the panel.

With the track schematic mounted on the base, I place the control panel face down on a flat surface so that I can see the holes in the metal base. Then I run the blade of my hobby knife around the edge of each hole. It may take several passes to cut completely through the paper and plastic. The finished control panel shown in **fig. 4** already has some push buttons and toggle switches installed.

After you've acquired the materials and built at least one, you'll be able to make these control panels in a matter of minutes. The finished result will look a lot better than anything you could have done with a ruler and a roll of tape. **MR**

Wayne McNab lives on Pender Island, B.C., Canada, and models early 20th century logging and mining operations in HO scale. His article "Easy interior lighting with DCC power" appeared in the May 2008 Model Railroader.

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6 decades on the South Shasta Lines



1. A Challenger and Cab-Forward meet at Redding on Godfrey Humann's South Shasta Lines. The 42 x 60-foot layout took 42 years to complete.



2. Dunsmuir was the last town to be completed on the layout. As part of the golden spike ceremony in 1992, the South Shasta Lines *Blue Bonnet* is about to burst through a "Welcome" sign.

The steam-era Southern Pacific inspired this long-running O scale layout

By Godfrey Humann • Photos by the author

Steam power ruled the Southern Pacific main line through northern California when I started building my O scale South Shasta Lines in 1950. Gerber, Calif., where I've lived for most of my life, was a busy railroad town then, and it hosted a yard, engine terminal, and depot.

At the time of this writing I'm 96 years old, and big steam locomotives, like massive 4-8-8-2 Cab-Forwards, are long gone from the rails. Hardly a trace of the Southern Pacific remains in Gerber. However, steamers still run on my 42 x 60-foot model railroad. Since I first opened the layout to the public in the 1950s, the South Shasta Lines has shown 91,000 visitors what northern California and railroading looked like more than half a century ago.

Life-long dedication

Back in 1949, when I had a new house built in Gerber, I told my wife, Betty, that the house was hers, but the basement was mine. I planned to build an O scale copy of 100 miles of the Southern Pacific main line from Gerber to Dunsmuir, Calif., as it looked then. Because this route was south of Mount Shasta, I called my railroad the South Shasta Lines.

Although I was a full-time farmer and professional thresher, I found time to keep working on the layout. Betty, as well as my children, Freya and Paul, all took on various scenery and modeling projects and helped me build the South Shasta Lines.

When we finished our O scale version of Red Bluff in 1952, we invited the mayor of the real town to drive a

South Shasta Lines

O scale (1:48)
Layout size: 42 x 60 feet
Scale of plan: $1/8" = 1'-0"$, 24" grid
Numbered arrows indicate photo locations

Anderson Cottonwood underpass



Illustration by Rick Johnson and Kellie Jaeger

silver track spike in front of the depot. Local newspaper reporters and a four-piece band commemorated the event. The real-life mayors of Anderson and Redding, along with similar fanfare, were present at silver-spike ceremonies in 1957 and 1962, respectively.

In 1992, we finished the last town and the mayor of Dunsmuir drove a gold spike into the track in front of the O scale Dunsmuir depot. After 42 years the South Shasta Lines was complete.

Landmarks along the line

All the structures on the layout are scratchbuilt. Many have detailed interiors. The larger models took hundreds of hours to build.

In 1950 I sent a request to the Southern Pacific and they sent me official SP

plans for various structures along the line, including the Gerber enginehouse and the depots of several towns. Other notable structures include the Gerber Alfalfa Mill, which was one of the town's major industries.

There are 29 bridges on the layout, including the Redding Bridge and Cottonwood Underpass. I built most of the bridges from photographs and measurements that I'd taken from the prototype. I selectively compressed some of the larger bridge spans because of space constraints.

I also made the scenery look as close to each prototype location as possible. I used many natural materials, including large rocks, foliage, and sifted dirt taken from the actual places that I wanted to model.

Building locomotives

I built all 17 of my steam locomotives from kits, using many scratch-built details and parts. For reliable operation, I used 12-volt Pittman motors mounted in rubber cradles to power each model. I added lead weight to all the boilers for maximum traction.

The layout at a glance

Name: South Shasta Lines
Scale: O (1:48)
Size: 42 x 60 feet
Prototype: Southern Pacific
Locale: Gerber to Dunsmuir, Calif.
Era: 1940s to 1950s
Style: Walk-in
Mainline run: 450 feet
Minimum radius: 72"
Minimum turnout: no. 6
Maximum grade: 4 percent
Benchwork: open grid
Height: 38" to 54"
Roadbed: True-Scale roadbed
Track: Handlaid
Scenery: Joint compound over burlap
Backdrop: painted drywall
Control: cab control

More on our Web site

Read Godfrey's 1988 account of natural and man-made disasters that once threatened his South Shasta Lines. Download this vintage *Bull Session* column at www.ModelRailroader.com.

Although the South Shasta Lines is based on the Southern Pacific, my freelanced equipment includes some Union Pacific 4-6-6-4 Challengers lettered for the South Shasta.



I installed crew figures in each locomotive, including Challenger no. 3959, which took me 330 hours to build. The engineer inside that cab is a 1:48 copy of me.

All the engines have headlights and many have a red light inside the firebox that's visible through the fire hole inside the cab. I installed Model-Tronics sound systems in nine of the locomotives. These sound-equipped engines have proved especially popular with visitors to the layout.

Running the show

For layout operation I built two control panels, each of which controls 12 blocks and contains a 30-ohm rheostat. The main control panel, located at Gerber, operates all the turnouts on the layout. Another control panel is located at Red Bluff. Train orders are issued via intercom.

All trains are run at scale speed. To travel from Gerber to Dunsmuir and back takes 13 minutes for a passenger train and 15 minutes for a freight train. Engines are turned on a wye at Gerber just like they once were in real life.

Since the 1950s, we've opened the layout to the public on Sundays in April and May. I'd operate the main panel

3. The *Blue Bonnet* crosses the Cottonwood Underpass outside of Red Bluff. Godfrey scratchbuilt all the bridges on the layout from photos and dimensions taken from the prototypes.

and Betty would operate the panel at Red Bluff. Since Betty passed away in 1993, my daughter Freya now operates the second panel during shows.

We always keep a tight schedule, since shows are hourly from 1 to 4 p.m. A full house for a show is an audience of 75 people. We don't allow questions until the end of the show so that we can focus on running the trains and don't have any accidents on the line.

Over the years we've had visitors from all over the world, and I've enjoyed sharing my O scale South Shasta Lines with them. From its construction to its completion to its operation during shows, the layout has given my family and me a lifetime of wonderful memories. **MR**

While we were getting this story and the rest of the July issue ready for publication, we were saddened to hear that Godfrey Humann died on April 15, 2009. The staff of Model Railroader offers its sincere condolences to his family and friends. – Ed.

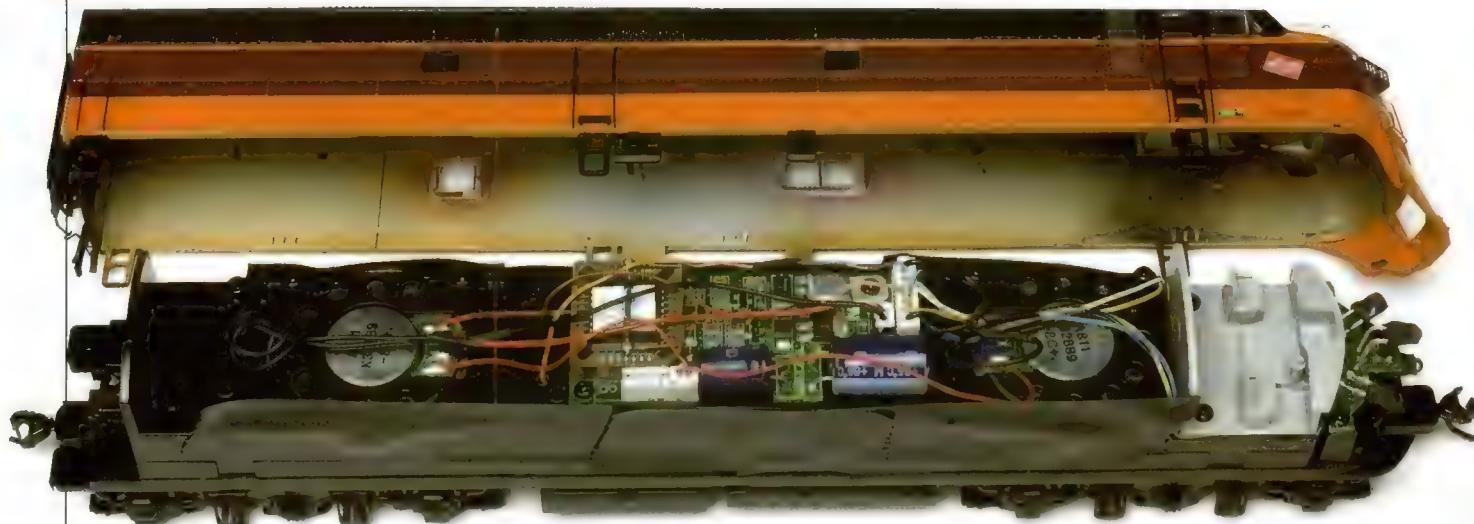
Meet Godfrey Humann

Godfrey Humann received his first train set for Christmas in 1921 when he was 9. Then 25 years later he bought an O gauge Lionel Berkshire train set and became a lifelong model railroader. For more on his South Shasta Lines, see the May 1984 and April 1992 issues of *Model Railroader*.



4. In this vintage photo, Godfrey looks on as one of his Challenger 4-6-6-4s passes the Gerber Alfalfa Mill. The locomotive took him 330 hours to build.

Adjust motor performance with back-electro-motive-force control



One of the many advantages

Digital Command Control (DCC) has over direct current (DC) is that it can provide precise motor control. You can use back electro-motive force (back EMF) to get smooth slow-speed operations.

What is back EMF? As a DC motor turns, it acts like a generator as well as a motor, producing a counter voltage to the voltage driving it. Back EMF is proportional to the speed of the motor, so the faster the motor turns, the higher the voltage is.

In DCC, the motor decoder measures the counter voltage and compares it to the throttle setting. If the motor is going too slowly, it increases the driving voltage. If the motor is turning too fast, it decreases the driving voltage.

Simple, right? Well, like most things in electronics, it's more complicated than this basic explanation. Motor decoders with back-EMF control use different PID algorithms (formulas) to fine-tune that process.

The "P" in PID stands for proportional. When the motor speed gets too high, the driving voltage drops. The inverse happens with the motor speed is too low.

The difference between the throttle setting and the motor speed is called the error. The problem with just using the proportional portion of the algorithm is that it

takes the motor a while to settle at a constant speed. As the motor is speeding up, it overshoots the throttle setting, decreasing the driving voltage and undershooting the throttle setting. The speed at which the error is corrected is called the gain. Some decoders allow you to set that in a Configuration Variable (CV).

To reduce the over- and undershooting of the throttle setting, the "I," or integral, part of the algorithm is introduced. This looks at the average speed error over a period of time instead of the instantaneous speed error. It's adjustable on some decoders.

The "D" part of the algorithm stands for differential. This adjusts for the rate of change of the load, throttle setting, a grade, or binding in the mechanism. Not all decoders use the "D" part of the algorithm.

Though this sounds complicated, you don't have to completely understand algorithms to tune your locomotives. Each manufacturer has a non-“geek speak” explanation in its product manuals. [See “Back-EMF control for specific manufacturers,” opposite. – *Ed.*]

Back-EMF control is especially useful at slow speeds, such as when switching. Without it, small imperfections in track, going up or down a grade, and binding in the locomotive's gears can drastically

You can get smooth slow-speed operations on your Digital Command Control-equipped locomotives with back-electro-motive force. Jim Forbes photo

affect the speed of the locomotive. In some instances, it might cause the locomotive to stop.

When running trains on the main, you might want the locomotive's speed to change when going up a grade to simulate prototype operations. However, consisting locomotives (running them in multiple unit) that are equipped with back-EMF control can pose a problem. Because the speed of two locomotives is difficult to match exactly, the locomotives tend to fight each other, especially when starting up or down a grade. For this reason, some manufacturers have CVs that control at what speed the back EMF cuts out.

Since the National Model Railroad Association doesn't specify how back-EMF control is implemented in motor decoders or what CVs are used to adjust it, each manufacturer uses a different method and terminology.

I made adjustments to the back-EMF control on one of my Walthers locomotives that has factory installed DCC. It has a QSI decoder that is programmed in the same fashion as aftermarket decoders from QSI Solutions.

► Back-EMF control for specific manufacturers

In the following list, I've included several decoder manufacturers, their term for back-EMF control, and a Web site address for additional information. — M.P.

Digitrax: Scaleable speed stabilization. The application note "Setting up scaleable speed stabilization in Digitrax decoders" can be viewed at www.digitrax.com/appnote_bemf.php. The note also has information on adjusting a locomotive's back-EMF control Configuration Variables (CVs).

ESU: Load control. The firm has notes for setting up locomotives in its online manual at www.loksound.com. The manual includes settings for various types of motors.

Lenz: Load compensation. To view the application note "Getting the most out of back-EMF decoders," visit www.lenz.com/products/decoders/current-decoders/backemf.htm.

Model Rectifier Corp. has a preset PID algorithm and notes how to turn it on and off in each

decoder's manual. The manuals are located at the following URL: www.modelrec.com/train-controls/dcc-decoders.asp.

QSI Solutions: Load compensation. Detailed information can be found in the Quantum Revolution manual at www.qsisolutions.com/pdf/quantumdccrefmanual_4_4_1.pdf.

SoundTraxx Tsunami: Hyper-drive. Details on how to set it can be found in the decoder user's manual at www.soundtraxx.com/index.php?p=manuals.php.

Train Control Systems: Load compensation. The firm has a back-EMF control manual at www.tcsdcc.com/pdf/BEMF.pdf.

In addition, **Tony's Train Exchange** has a back-EMF control summary on its Web site, www.tonystrains.com/technews/introtobemf_pid.htm.

Litchfield Station also has a brief explanation of back EMF at www.litchfieldstation.com/DCC-University/FaqBEMF.htm.

In the *Quantum DCC Reference Manual Version 4.4.1*, there are detailed instructions on how to fine-tune a locomotive's back-EMF properties. The QSI decoders are unusual because they have four different ranges of back EMF.

Each range has own PID settings, but only the latest firmware has settings for the integral part of the algorithm. My locomotive has older firmware, so it has settings for only the proportional and differential parameters.

QSI uses an indexed method to control certain CVs. For example, CV 56.18.0 controls the proportional part of the PID algorithm for very slow speed. The actual CV number is 56, the primary index is 18, and the secondary index is 0. Configuration Variable 49 controls the primary index and CV50 programs the secondary index. This may sound confusing, but once you get the hang of it, it's pretty easy.

To program CV 56.18.0, I first changed CV49 (primary index) to 18. I then programmed CV50 (secondary index) to 0 and CV 56 to the desired value.

Much of the programming is done by trial and error. To effectively fine-tune your locomotive, programming on the main (op-mode programming) is a must. There are too many adjustments to be made to make moving the locomotive between the programming track and the main practical.

By following the procedure as written in the manual, I found that my locomotive performed well after adjustment without any surging or hunting. **MR**

Send your questions about Digital Command Control to DCC Corner, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail dcc@mrmag.com. We regret we can't answer all the questions we receive.

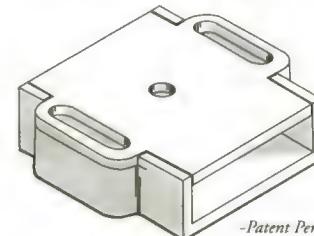
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Product Reviews



Sound-equipped Big Boy in HO depicts a hard-working Union Pacific steamer

With a coat of factory-applied grime and rust, this HO scale Big Boy looks like it's seen years of hard use. Since the late 1960s Rivarossi has manufactured Big Boy 4-8-8-4 locomotives in HO scale. This is the first Rivarossi Big Boy to be weathered and to include a dual-mode Digital Command Control sound decoder.

Prototype. The 4-8-8-4 Big Boy is generally acknowledged to be the largest steam locomotive ever produced. The Rivarossi model represents one of the first group of Big Boys (nos. 4000 to 4019) delivered to the Union Pacific by Alco in 1941. The UP received five more Big Boys in 1944.

The UP developed the articulated, simple-expansion 4-8-8-4 to handle the steady grades on the line between Ogden and Wasatch, Utah, without a helper. The Big Boys were also fast enough to keep up with the UP's steady traffic flow. The locomotives made their last regular runs in 1959. Several Big Boys have been preserved.

Factory-applied weathering. The weathering on the Rivarossi model is quite heavy. Compared to color photos that I found, the weathered

model doesn't capture the look of an aging Big Boy in the 1950s.

An especially heavy coat of rust and brown cover the locomotive's running gear and lower part of the tender. Additional streaks of rust follow the rivet seams along the tender's water tank. There are also white streaks down the boiler under the pop-off valves, simulating the mineral deposits or "scale" left behind from condensing steam.

The lettering on the locomotive and tender is straight, neatly applied, and matches prototype photos. Smaller printing, such as the test stencils on the air reservoirs, paint stencil on rear of the tender, and the builder's, equipment trust, and superheater patent plates are legible under magnification.

Dual-mode DCC. The dual-mode ESU LokSound DCC decoder is mounted on top of the motor inside the boiler. A single speaker faces upward in the smokebox. The large centipede tender (perfect for a speaker enclosure) is empty except for a backup light and a two-wire cable that connects it to the decoder in the locomotive.

In DC, the model started moving at 7 volts and features the sound of four chuffs per wheel revolution. As



The Big Boy's tender features wood-plank detail on the deck and an operating backup light.

74 Rail-Lynx command control system
 75 Athearn HO FMC covered hopper
 76 Con-Cor N scale Aerotrain
 78 Walthers HO Pullman sleeper

80 Broadway Limited BlueLine AC-5
 Branchline Crosby's Coal in N scale
 82 Atlas N scale 1932 ARA boxcar
 Blair Line HO scale used-car lot

Dana Kawala



the locomotive's speed increased, some chuffs overlapped, simulating the front and rear engines going in and out of sync. The overall sound quality is good, although the chuffs have a short staccato quality when compared to those of a prototype steam locomotive.

When the locomotive is still, random sounds play, including the air pump and water injector. There's also the sound of a fireman shoveling coal, although the prototype was stoker-fired.

There are more sound and programming options available in DCC. The model has 13 DCC functions, including a bell and a long and short whistle. The decoder supports 14, 28, or 128 speed steps.

I easily changed the model's long address to the locomotive number. The decoder features many adjustable configuration variables (CVs), including the individual volume levels of the bell, whistle, and random sound effects. A list of all the programmable CVs is available in an extensive user manual that can be downloaded at www.esu.eu.

In both DC and DCC the Big Boy has impressive speed control. The

model crept along at 1 scale mph without any binding or hesitation and accelerated to a top speed of 68 scale mph (55 scale mph at 12 volts in DC mode).

Model construction. The tooling and mechanism of the model are the same that Rivarossi has used since it introduced its HO Big Boy in the late 1960s. Most of the model's dimensions match drawings in the *Model Railroader Locomotive Cyclopedias Vol. 1: Steam Locomotives*. (Kalmbach Publishing Co.) There are some compromises to scale fidelity to help the model achieve an 18" minimum radius.

On the model, the pilot truck and front engine are about a scale foot farther forward than on the prototype. The drivers are just under 64 scale inches in diameter, while the prototype had 68" drivers. The four-wheel lead truck on the tender is a scale foot farther forward than the prototype.

The Rivarossi Big Boy is built primarily of plastic with crisp molded detail, such as the rivet seams. Separately applied detail parts include handrails, throttle linkage, and aftercoolers on the pilot deck. A package of user-installed brake hangers and cab handrails is also included.

The flywheel-equipped can motor inside the boiler has two worm gearshafts connected to gearboxes on the third axle of each engine. The side rods transfer power to the rest of the axles.

The third set of drivers on the front engine has traction tires, which contribute to the model's impressive 5-ounce drawbar pull. A set of user-installed drivers without traction tires is included.

I ran the model through 18" radius curves without difficulty, although it looks much more realistic on broader curves. The rear engine on the locomotive pivots, as does the rearmost wheelset in the pedestal truck on the tender. This is unprototypical, but helps the Big Boy negotiate tight curves.

When maneuvering through a yard on our layout, the Big Boy

► HO scale Big Boy

Price: \$419.99 (\$329.99, DC)

Manufacturer

Hornby America, Inc.

3900-C2 Industry Drive East
 Fife, WA 98424

www.hornbyamerica.com

Road numbers (all Union Pacific): no. 4014 (DCC), no. 4007 (DC)

Features

Dual-mode DCC sound decoder (DCC version only)

Factory-applied weathering
 Five-pole skew-wound motor with flywheel

Metal RP-25 contour wheels in gauge

Minimum radius: 18"

Operating magnetic knuckle coupler mounted at correct height on rear of tender

Weight: 26.75 ounces (engine and tender); 18.5 ounces (engine only)

Rivarossi HO Big Boy

Drawbar pull	5.0 ounces	70 HO scale freight cars
Scale speed (DC)		Scale speed (DCC)
Volts	Scale mph	Speed step Scale mph
7 (Start)	1	1 1
9	15	7 14
11	39	14 30
12	55	28 68
Current draw at 12 volts (DC)	Slipping .2A	
	Stalled .4A	

stalled through some turnouts because of the model's limited electrical pickup. The locomotive picks up power through a total of eight wheels: the left wheels on the lead truck, the right wheels on the trailing truck, the first and fourth drivers on the left side of the front engine, and the first and fourth drivers on the right side of the rear engine. None of the tender's wheels picks up power.

Hopefully the firm will address the power pickup issue for future releases. The Rivarossi model has great slow speed performance and a smooth mechanism that operates well on both DC and DCC layouts. — *Dana Kawala, associate editor*

More on our Web site

Subscribe today and watch a video of the Rivarossi Big Boy in action, as well as get other great online extras at www.ModelRailroader.com.

Rail-Lynx wireless system is an alternative to DCC

Modelers have many choices for adding wireless walkaround control to their locomotive fleets. The Rail-Lynx infrared command control system is an easy-to-use option for modelers who don't want to install or rewire their layouts for Digital Command Control.

Unlike a DCC system that uses the rails to send information to a DCC decoder, Rail-Lynx sends commands from a throttle to a receiver through the air using an infrared signal.

The main components of the system are the handheld wireless throttle, infrared sensor-equipped receivers for each locomotive, and a power supply (not included) that supplies 12 volts DC to the track.

Infrared receivers. We reviewed the RX3-P receiver, which has an eight-pin plug designed to fit into a DCC socket. This plug can be removed to hard-wire the receiver to a locomotive that doesn't have a socket. As with a DCC decoder, the locomotive's motor must be electrically isolated before installation.

Unlike a DCC decoder installation, you'll need to wire the two included infrared sensors to the Rail-Lynx receiver. The domed "eye" of the sensor picks up the infrared signal from the throttle, so it cannot be hidden completely inside a locomotive's shell. Our sample receiver came installed in an Athearn HO SD40T-2 with the sensors mounted behind the see-through radiator grills.

Rail-Lynx sells receivers in a variety of sizes for N, HO, and O scale applications, but none include sound. The firm also offers an installation service.

Power supply. Rail-Lynx works with 12 volt DC power supplies, variable output power packs, and most DCC systems.

I ran our test engine on a layout that uses an MRC Prodigy Advance DCC system. The model responded to every command and didn't interfere with any DCC-equipped locomotives. Rail-Lynx also worked well on our DC test track.



► Rail-Lynx system

Price: \$139.95 (handheld throttle), \$39.95 (RX-3P receiver)

Manufacturer

Rail-Lynx

1 Cottontail Lane
Columbia, NJ 07832-2752
www.rail-lynx.com

Features

255 channels
Cab measures 1 1/2" x 2 1/4" x 4 1/2"
Each receiver has primary and secondary channel
Each receiver includes two infrared sensors
Eight levels of momentum
Individual headlight control
Operates on DC or DCC layouts
Supports auxiliary lighting functions, such as Mars light

equipped locomotives present to avoid inadvertently reprogramming your entire fleet.

You can choose between eight momentum levels, which set deceleration and acceleration rates, and four preset speed tables for each receiver. A fifth speed table can be programmed by the user with free software available from the Rail-Lynx Web site.

If you're looking for a reliable, easy-to-use wireless command control system that bypasses traditional DCC layout wiring, and you're not particularly interested in on-board sound or advanced programming, then Rail-Lynx is worth your consideration. —D.K.



HO FMC hopper receives makeover

At first glance, you may be wondering why we're reviewing a car that first appeared in the magazine in September 1992. Well, since Athearn acquired the Roundhouse tooling for the FMC 4,700-cubic-foot-capacity covered hopper, it has extensively upgraded the model as part of its Ready-to-Roll line.

Prototype. Between 1971 and 1981, FMC built nearly 7,000 of these 100-ton covered hoppers. Burlington Northern purchased more than 4,500. The rest went to Chicago & North Western, Denver & Rio Grande Western, and various private owners.

Over the course of the car's production, there were variations in the slope of the car roof, running board width, style of roof hatch, vertical end bracing, and outlet

gates. The Athearn model will be offered with long or short outlet gates as appropriate.

Numerous upgrades. Some of the model hopper's many improvements include etched-metal running boards and crossover platforms, separately applied grab irons, thin stirrup steps, and formed wire roping eyes.

Probably the biggest change is the brake detail on the B end of the car. The original car had only a brake cylinder, AB valve, and air reservoir. In addition to these details, the upgraded model has separately applied brake pipes, a brake lever (on A and B ends), and a thinner brake wheel with a molded plastic brake chain.

Dimensionally accurate. The hopper's dimensions closely match prototype drawings published in the *Simmons-Boardman 1980 Car and Locomotive Cyclopedie*. The correctly gauged 36" metal wheelsets are mounted on plastic axles, and the McHenry scale magnetic knuckle couplers are mounted at the correct height. The car weighs 4.8 ounces, which is 0.3 ounces too heavy based on National Model Railroad Association Recommended Practice 20.1.

Our sample is decorated for Burlington Northern. The Cascade Green paint is smooth and evenly applied, and the white lettering is opaque. When compared to prototype photos, the BURLINGTON NORTHERN lettering appears slightly oversized. On the model, some of the lettering is printed on the sides



This photo shows the original Roundhouse car (left) and the upgraded Athearn model. The detail speaks for itself.

of the exterior posts. On the full-size cars, the lettering fits between the posts.

There are a few voids in the BN herald between the exterior posts and car sides and along the car's horizontal seam, but this can easily be touched up with white paint.

The upgraded hopper also has reporting marks and safety stripes on the car ends, hopper bay capacity printed above the vibrator brackets, and smaller stencils such as BK. CYL. REL. and 2 IN. H.F. COMP BRAKE SHOES on the car sides. Nicely done.

Athearn has been improving existing tooling for a while now. Of the upgraded models I've seen, the FMC 4,700-cubic-foot-capacity covered grain hopper is one of its best efforts to date. — *Cody Grivno, associate editor*

► HO FMC covered hopper

Price: \$24.98

Manufacturer:

Athearn Trains

1550 Glenn Curtiss St.
Carson, CA 90746

www.athearn.com

Road names (three numbers each): Arthur (N.D.) Farmers Elevator Co., Burlington Northern, BNSF Ry. (pre-2005 mineral red scheme), Chicago & North Western, Denver & Rio Grande Western, First Union Rail (ex-Farnhamville, Iowa), Klemme Coop Grain, St. Louis-Southwestern, and Western Pacific



Sleek lines and crisp details highlight N scale Aerotrain

Following the success of the HO scale Aerotrain, reviewed in the May 2008 issue of *Model Railroader*, Con-Cor now offers this articulated passenger train in N. The ready-to-run model is designed for direct-current layouts, but provisions are included for adding Digital Command Control and sound.

Prototype history. The two nine-car Aerotrains were each powered by a single LWT12 locomotive, a streamlined, regeared version of the SW1200 diesel switcher with one Flexicoil truck and an unpowered rear axle. The Aerotrain could reach a top speed of 102 mph. A third LWT12 was built for use with Rock Island's Talgo-built *Jet Rocket*.

The coaches were General Motors' 40-seat intercity bus bodies widened 18" and mounted on a two-axle steel underframe. The vestibules were located where the driver and engine compartments would be on a bus. Rubber bellows gave the coaches a bus-type air suspension.

During 1956 and '57, the Atchison, Topeka & Santa Fe; New York Central; Pennsylvania RR; Rock Island; and Union Pacific tested the Aerotrain. Despite its sleek appearance, the Aerotrain never caught on. Electro-Motive Division sold both Aerotrains to Rock Island in 1958, which used them in commuter service in Chicago. In 1966 the Aerotrains were retired.

Like the HO scale version, the N Aerotrain LWT12 has a finely detailed injection-molded plastic body shell with separately applied wire grab irons, a detailed cab interior with two painted crew

figures, and clear window glazing with printed windshield wipers. The LWT12 has separately applied Aerotrain emblems, which were mounted crooked on our sample.

The body shell is held on the frame by six tabs (three on each side) that are evenly spaced between the front truck and rear axle. The manufacturer recommends using a toothpick or a similar soft prying device to remove the shell. Don't use a screwdriver, as this may damage the shell.

The locomotive has a die-cast metal chassis, which accounts for most of the train's 5.7 ounces of weight. A five-pole skew-wound motor is seated in the fuel tank with a printed-circuit (PC) board on top.

The locomotive has two traction tires to increase pulling power. Since the non-traction-tire equipped wheelsets on the locomotive and the wheels on all the cars pick up electricity, the train runs through turnouts without stalling.

The four-axle Flexicoil truck is covered by skirts attached to the chassis. The skirts pivot freely, allowing the locomotive to negotiate tight curves. The single-axle rear truck also has some play so it can follow curves. The blackened nickel-silver wheels are mounted on split axles and are correctly gauged.

Performance. The Aerotrain started moving at 3 volts with a rather jerky motion, but began to smooth out around 4 volts. The train achieved a top speed of 156.3 scale mph, 54 mph faster than the prototype. The locomotive's 1.9 ounce drawbar pull should be sufficient to pull a nine-car train.

N scale Aerotrain

Price: \$429.98 (engine, two coaches, and tail car). Three add-on coaches \$219.98

Manufacturer

Con-Cor International
8101 E. Research Ct.
Tucson, AZ 85710-6758
www.all-railroads.com

Road names: General Motors Demonstrator; Atchison, Topeka & Santa Fe; New York Central; Pennsylvania RR; Rock Island; and Union Pacific. Painted silver but unlettered version available.

Features

Detailed car interiors
Diaphragms between cars
Five-pole skew-wound motor with dual flywheels
Light-emitting diode interior lighting with printed-circuit boards in each car
Painted crew figures
Reversing headlights and tail car backup lights
Weight: 5.7 ounces

Con-Cor N scale Aerotrain

Drawbar pull	Scale speed (DC)	
	Volts	Scale mph
1.9 ounces	3 (start)	1.3
13 N scale passenger cars	6	44.0
Current draw at 12 volts (DC)	9	104.5
Slipping	12	156.3
Stalled	.10A	
	.12A	

As on the HO model, beams from a group of light-emitting diodes (LEDs) are reflected through plastic light bars to illuminate the nose headlights and number boxes. In reverse, the red marker light on the locomotive and white light on the tail car are illuminated.

I also ran the Aerotrain on our N scale Carolina Central layout, and it



The tail car has directional tail-lights. The red light is illuminated when the train is moving forward.

passed over turnouts and the 9 3/4" radius curves smoothly.

The coaches and tail car have crisp fluting and rivet detail. All three cars have press-fit window glazing, wire grab irons, and dark gray seats with white headrest covers. Each car's interior is illuminated with LEDs.

The passenger cars ride on single-axle trucks. The metal wheels (mounted on plastic axles) were out of gauge on all three cars. I fixed them by twisting the wheels back into gauge.

Since the four-unit Aerotrain is wired as one circuit, the cars need to be oriented with the vestibule forward so the electrical connections can be made. The eight-pin plug from the locomotive and each coach must be connected to the socket in the adjacent car.

The full-width vinyl diaphragms are cleverly designed. Each one is mounted on a steel pin so it can move as the train operates on curves, and magnets in the striker plates hold the cars together so they don't separate.

Per the manufacturer's recommendations, the wires from each eight-pin plug should be run under the diaphragms so they can move from side to side as the train runs through curves.

The Aerotrain is one of the most recognizable streamlined trains of the 20th century, and Con-Cor has done a great job re-creating it in N scale. Those looking to model the full nine-car train can do so with the three-coach add-on sets, priced at \$219.98 each. — C.G.

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Pullman sleeper kicks off Walthers' HO scale 1948 *20th Century Limited*

The newest entry in Walthers' series of HO scale passenger trains is the 1948 edition of the New York Central's *20th Century Limited*, and the first car in the set is this smooth-sided 4-4-2 Pullman sleeper. With accurate details, it gets the series off to a strong start.

Prototype. Pullman actually built these plan 4069B 4-4-2 (4 bedroom, 4 compartment, 2 drawing room) cars for the 1938 edition of the *Century*, at which time they carried names in the *Imperial* series and had light gray sides, dark gray window bands, and full skirting. The NYC had the 10-year-old cars refurbished (including removing the skirts) and repainted with dark gray sides and a light gray window band for the 1948 *Century*. At that time they received new names in the *Bridge* series. The cars did carry full-width diaphragms for the 1938 train and at the introduction of the 1948 train, but those did not survive for long.

Modelers who want to depict the *Century* precisely will want different numbers of each sleeping car depending on the year modeled.

The model. Though Walthers has offered a smooth-side 4-4-2 in HO scale for several years, this is an all-new car with subtly different window placement and substantial differences in the underframe. It also has model 43-R triple-bolster roller-bearing trucks, which are correct for this car. The cars that

were new for the 1948 *Century* used 41-C-11 trucks.

The 43-R trucks look good, though detail-oriented modelers will want to drill through the large holes on either side of the springs. The car doesn't roll especially well because of the metal-on-metal contact between the sideframes and the axles. You'll also want to lubricate the axle ends with low-viscosity plastic-compatible oil, as outlined in the instructions. The trucks do pick up electricity, but the car isn't lighted; a separate lighting kit (Walthers no. 1049) is available for \$11.98. To remove the roof to install lighting, twist the car gently until some of the clips snap out of the slots in the skeleton frame.

The construction of this car will be familiar to modelers with other Walthers passenger cars – a styrene plastic skeleton frame with snap-on styrene sides, ends, underframe, and roof. The interior is also molded styrene, and the underframe comes with all the key details added. Adding car name decals and installing and painting handrails are left up to the purchaser. One switch from earlier cars is that the *Century* cars have all-metal Proto Max knuckle couplers in the traditional size, not scale size. The flush-mounted windows don't have painted frames. The car matches the dimensions on a Pullman floor plan closely.

The paint on our sample was smooth and the (gray) striping/lettering has white edging, which is

► HO scale Pullman sleeper

Price: \$64.98

Manufacturer

Wm. K. Walthers Inc.

P.O. Box 3039

Milwaukee, WI 53201

www.walthers.com

Road names: New York Central, undecorated

Features:

36" metal wheelsets with RP-25 contour, correctly gauged

Detailed underframe

Flush-mounted windows

Metal knuckle couplers with coil springs in swinging boxes, at correct height

Modeler-installed car name decals and handrails

Weight: 7 ounces (Correct per NMRA RP-20.1)

correct for the period. One of the end-of-car road names was slightly out of alignment. The dark gray paint has a different tint than that on earlier Walthers NYC gray cars. Walthers discovered a set of the original Dupont paint chips and matched that paint for these cars.

With this 4-4-2, Walthers has added another important streamlined car to its line. The Atlantic Coast Line, Canadian National, Illinois Central, and Pennsylvania RR had *Imperial* cars. And just like on the prototype, I'm sure they'll find a home on many HO scale lines. – Terry Thompson, publisher

More on our Web site

To get consist lists for the *20th Century Limited* during the last 30 years of the train's history, visit our Web site at www.ModelRailroader.com.

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Photo by Robert F. Collins, from Northern Pacific in Color Vol. 2: 1949-1959 (2002, Morning Sun Books)

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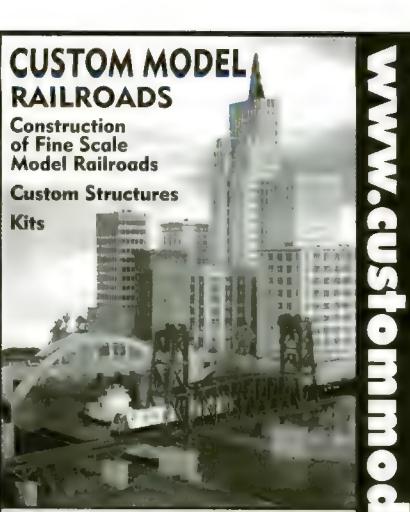
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Product Reviews

► BLI BlueLine HO scale Southern Pacific Cab-Forward



Price: \$399.99

Manufacturer

Broadway Limited Imports

4 Signal Ave., Suite C
Ormond Beach, FL 32174
www.broadway-limited.com

Comments: Broadway Limited Imports has added its Southern Pacific class AC-4 and AC-5 Cab-Forward to its BlueLine product line. The locomotive is now available with a direct-current sound system at a price \$100 lower than its Digital Command Control-equipped predecessor. (The DCC version is reviewed in the August 2004 MR.)

The locomotive includes an eight-pin DCC decoder socket. It's also designed to accept a Suthe smoke unit.

Our sample had the same robust sound effects as the earlier

version. Exhaust sounds start at just over 6 volts. There are four chuffs per wheel revolution. Other effects include brake squeals and valve hisses. A DC Master control module, sold separately, lets the DC user manipulate the bell, whistle, and volume controls, as well as other decoder settings.

Our model's tender bears the post-1946 large SOUTHERN PACIFIC lettering. Broadway Limited offers the locomotive as a class AC-4 or AC-5, with slightly different details; each version is available with two road numbers, plus painted but unlettered.

Broadway Limited continues to expand its BlueLine offerings, putting high-end sound and details within the reach of modelers with DC layouts. — Steven Otte, associate editor

► Branchline Trains N scale Crosby's Coal kit

Price: \$31.99

Manufacturer

Branchline Trains

333 Park Ave.
East Hartford, CT 06108
www.branchline-trains.com

Comments: This laser-cut wood kit is based on a prototype located along the former Rutland RR in Danby, Vt. The model uses peel-and-stick trim, details, and roofing; styrene channel for the coal chutes; and a one-piece resin base with molded coal piles.

Though the kit has a modest footprint of 13 1/4" x 2 1/2" x 4", it's packed with detail. Individual braces under the roof, separately applied doors above the coal chutes, and freestanding ladders are just some of the highlights. The parts are fragile, though, so handle them with care.

The peel-and-stick shingles supplied with the kit looked oversized, so I replaced them with HO/N scale modern brick from



The N Scale Architect's Model Builder's Supply Line. The molded plastic brick closely approximates the size of N scale shingles. I attached it with double-sided tape.

The cast-resin base needed some touch-up work before I could attach it to the building. I used medium-viscosity cyanoacrylate adhesive (CA) to fill voids in the casting. Once the CA had dried, I smoothed it with a mill file.

Though Branchline Trains is known for its freight and passenger cars, its wood structures shouldn't be overlooked. They're easy to build and look great. — C.G.



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Product Reviews

► Atlas N scale 1932 ARA boxcar

Price: \$22.95 (\$17.95, undecorated)

Manufacturer

Atlas Model Railroad Co.
378 Florence Ave.
Hillside, NJ 07205
www.atlasrr.com



Comments: A highly detailed plastic model of an American Railway Association (ARA) standard boxcar of 1932 is available in N scale. The ready-to-run model matches prototype drawings and has a level of detail that rivals Atlas' HO model.

Our sample has 4/4 Dreadnaught ends and a Murphy panel roof. A Warrior River Terminal car that has flat riveted ends and a flat 11-panel roof is also available.

Separately applied details include brake rigging, brake wheel, and tack boards.

The model's plastic RP-25 contour wheelsets are all in gauge. The Accumate operating

magnetic knuckle couplers are mounted at the correct height per National Model Railroad Association standard S-2. The car weighs one ounce, which is correct per NMRA RP-20.1.

All the lettering on our Central of Georgia sample is opaque and straight. Atlas also offers the car in other road names (two road numbers each): Clinchfield, Maine Central, Missouri Pacific, and Warrior River Terminal. Undecorated versions are available.

A total of 14,784 boxcars were built to this design. We hope Atlas will offer more road names. The N scale car is an accurate model of its historic prototype. – D.K.

► Blair Line HO scale A-to-Z Used Cars kit



Price: HO scale, \$47.95; N scale, \$37.95

Manufacturer

Blair Line
P.O. Box 1136
Carthage, MO 64836
www.blairline.com

Comments: Blair Line's new kit would look right at home on HO and N scale layouts from the 1950s to the present. A-to-Z Used Cars is a laser-cut wood kit that assembles easily into a quintessentially American business.

The kit features tab-and-slot construction, printed peel-and-stick signs, laser-etched wood

sidewalks, a freestanding billboard, acetate window glazing, and peel-and-stick details. I assembled the HO scale version.

The main building has distressed wood siding with laser-etched nail holes. Enough sidewalks are supplied to configure the business on a straight or corner lot. Also supplied are a ladder, spare tires, and an old-style soda machine, all of which are wood and require painting. Vehicles are not included.

A-to-Z Used Cars would be a great place for a modeler to show off favorite scale vehicles. – S.O.



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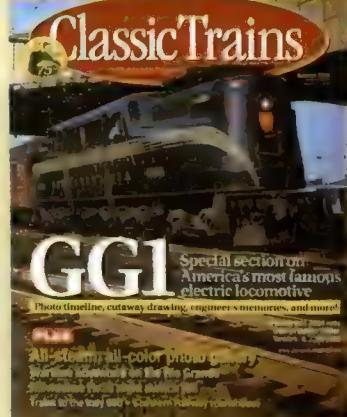
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Trackside Photos



Preston George photographed Missouri-Kansas-Texas no. 882 (right) on the Boggy Creek Bridge in Oklahoma in December 1948. When Shane Murphy of Argyle, Texas, reproduced the scene on his HO MKT Fort Worth Subdivision, he included a figure of George shooting the photo. George's picture is from the *Trains* collection; Blair Kooistra photographed the model.





As a very short New York Central peddler passes overhead, Electro-Motive Division NW2 no. 1166 pulls a gondola of scrap metal from the junkyard at Port Richmond on Howard Dwyer's HO scale Island Central RR. Howard, of Farmingville, N.Y., shot the photo.

Want to see your work in Trackside Photos?

Trackside Photos is a showcase for the work of *Model Railroader* readers. We encourage contributions. Send your photos (original color slides or digital images 5 megapixels or better on CD-ROM) to: *Model Railroader*, Trackside Photos, P.O. Box 1612, Waukesha, WI 53187-1612. Include caption information, such as a description of what's going on in the picture; the name, scale, era, and locale of the layout; and information about the rolling stock or structures pictured. For a copy of our photo submission guidelines, contact editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrmag@mrmag.com.

Trackside Photos



Maine Central Electro-Motive Division F3 no. 672 leads passenger train 163 into Crawford Notch, N.H., on a summer day in 1950. William S. Moore of Imlay City, Mich., built the scene on his HO scale Boston & Maine layout. He also took the photo.





Alco RS-27 no. 2408 pulls a local freight into James Alfred Yard, Columbia, Pa., while Electro-Motive Division SW7 no. 8584 sits by the yard office, ready to go to work. Donald Jay Herr, who actually lives in Columbia, Pa., photographed the scene on his HO scale Pennsylvania RR layout.

Grand Trunk Western 2-8-2 no. 3715, a superdetailed Broadway Limited light Mikado, has just finished taking on coal at White River Junction. Don Janes of Sarnia, Ont., Canada, took the photograph on his HO scale Boston & Maine Green Mountain Division layout, which was featured in *Great Model Railroads 2001*.

Retrofitting operations

Tony Koester



George Sellios (left), Tony Koester (center), and Dick Elwell confer about the Franklin & Southern Manchester's track schematic in preparation for the railroad's first formal operating session. Richard Josselyn photo

George Sellios has made quite a name for himself as the creator of the highly regarded Fine Scale Miniatures line of craftsman kits, as well as the HO scale Franklin & South Manchester RR. [See the December 2006 *Model Railroader* for more on the F&SM RR. – Ed.] When it comes to spectacular scenery and structures, George's name is often mentioned in the same breath with that of a man he deeply admires, the late John Allen of Gorre & Daphetid fame.

Two differences in these gentlemen's approach to the hobby come immediately to mind, however: John set his railroad in the high Sierras of the West Coast, and George's F&SM clearly evokes New England. And John had a strong interest in realistic operation, whereas George is primarily a structure builder.

Times change; interests change. John evolved from a professional photographer who built dioramas and a small layout as photo props to an avid operator who built two successively larger railroads that supported ever more extensive operations. And now George is taking a hard look at the F&SM to see how it could support realistic operation for himself and his crew.

Make no mistake: George is first and foremost a structure guy. He seems happiest when he has a new building to construct. But thanks to the efforts of his close friends like Richard Josselyn, Dick Elwell, and Thom Driggers, he is now open to "amortizing his investment." He has spent considerable time and effort building the railroad, so it's clearly time to reap the rewards by operating the railroad as realistically as it appears.

The day after Thanksgiving 2008, I met with George, Richard, Dick, and quite a few others to evaluate the F&SM's operating potential. I made a linear schematic diagram of the main line to see what difficulties that presented. To my relief, the railroad is simply a double-track oval with no nasty reverse loops that cause trains to occupy the same stretch of track more than once per lap.

More good news: There is now a branch that extends off the main to a visible, and fully scenicked, staging or fiddle yard called Fillmore. That creates a point of origin for, say, northbound trains.

Speaking of north – which way is that on the F&SM? George hadn't thought about where the railroad is actually located on a map. So we

dug out a map of New England and quickly located a Manchester north of Boston. The F&SM could therefore begin its run in the north end of Boston, go through South Manchester, and continue north to – where? New Hampshire? Maine? For the purposes at hand, we decided that the Maine Central's Rigby Yard in Portland, Maine, was a good end point.

We now needed a place at the north end to terminate trains. Fortunately, George had built a no-longer-used hidden staging area that was accessible from an aisle behind the backdrop. By re-laying track between the main line and that yard, the F&SM could reach Portland. Now the layout could be used as a point-to-point railroad for operations.

The south-end staging yard at Fillmore, Mass., was entirely visible, so there was no means for cars to enter or leave the yard from the nation's rail network. But there was a track that could connect to a new staging yard that would be supported on brackets along the front of George's workshop.

And there was more good news: George had built a small yard and engine terminal at Fellsburg near the mid-point of the railroad. Locals could work in both directions from there, and road trains could change engines there as well.

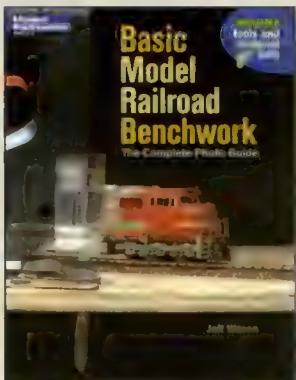
One problem remained. As the main line twisted and turned back over itself in several locations, George had used one depot for both levels. That wouldn't do on an operating railroad, as trains left Town A long before they arrived at Town B, despite the joint depots.

While John Allen also had a two-level depot on the GD-Line, he used a different station name for each level. In George's case, however, he would have to build new depots for the newly named upper-level towns, which was the best news George heard all day!

Deadlines ensure progress, so I left the F&SM crew with one: I'd be back in Boston for Thanksgiving 2009, and I expected to participate in one of the first formal operating sessions on the Franklin & South Manchester. I'll let you know how that turns out. **MR**

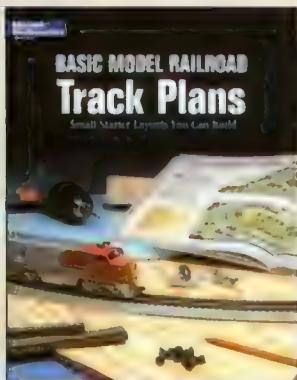
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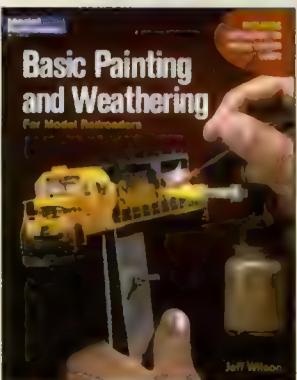
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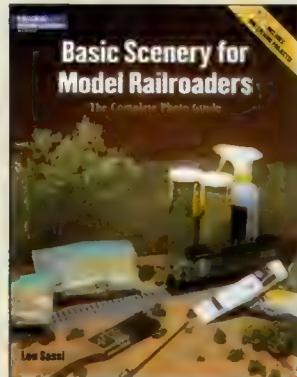
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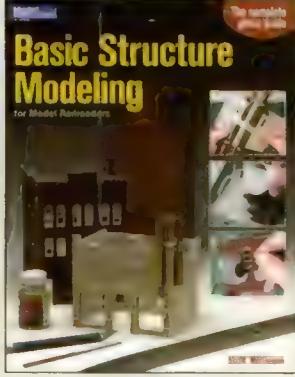
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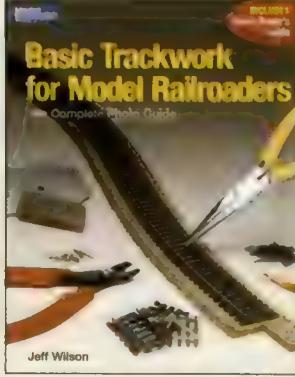
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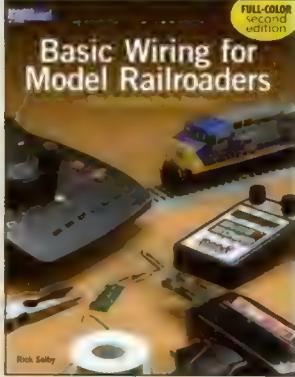
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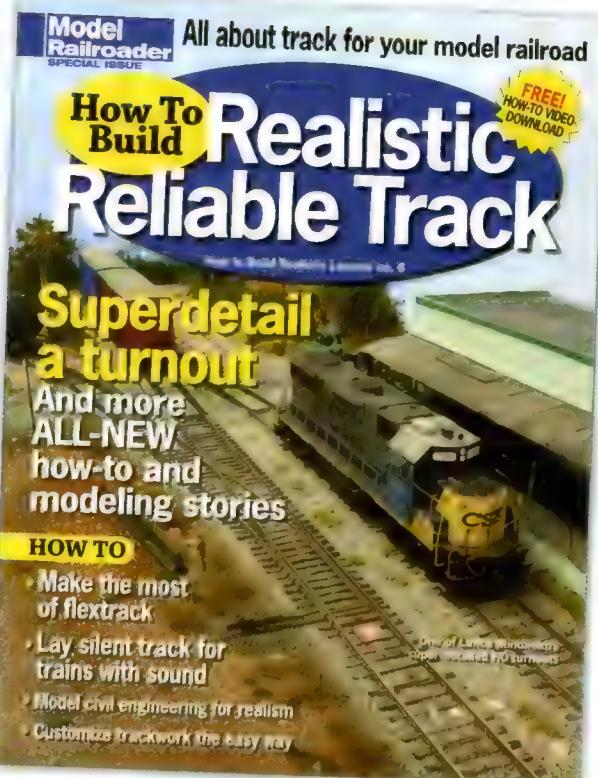
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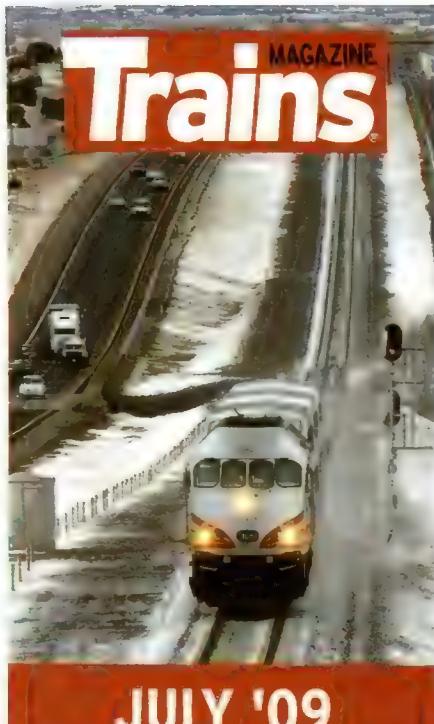
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CLOSING DATES: Jan 2009 issue closes Oct. 17, Feb. closes Nov. 18, Mar. closes Dec. 16, Apr. closes Jan. 16, May closes Feb. 16, June closes Mar. 20, July closes Apr. 17, Aug. closes May 15, Sept. closes June 18, Oct. closes July 17, Nov. closes Aug. 18, Dec. closes Sept. 18.

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AZ, PHOENIX: "IN THE HEAT" SWAP MEET North Phoenix Baptist Church, 5757 N. Central Ave. Sponsored by Roundhouse Rats. Saturday, July 25th, 2009, 9:00am-1:00pm. Adults \$5.00. All gauges, books, tapes, train rail memorabilia, accessories. Handicap accessible, good food. More information contact David Jerry 602-361-0356.

CA, SAN LEANDRO: ANNUAL JUNE OPEN HOUSE AND MODEL TRAIN SHOW San Leandro Historical Railway Society, 1302 Orchard Ave. June 6-7, 2009. Saturday 10:00am-5:00pm and Sunday 12:00pm-5:00pm. Donations Commed, \$10-569-2490 or www.slhs.org E-mail: slhs@yahoo.com

DE, HARRINGTON: 1ST ANNUAL TRAIN AND TOY SHOW Sponsored by the Harrington Parks and Recreation, 114 E Liberty Street. Saturday August 29th, 2009 from 9:00am - 4:00 pm. Admission \$2 - adults, children under 12 - FREE. Contact: Bill Falasco, 302-398-7975. E-mail: bfalasco@cityofharrington.us

DE, REHOBOTH BEACH: 6TH ANNUAL DELAWARE SEASIDE TRAIN SHOW Rehoboth Beach Convention Center, next to Firehouse. Saturday, June 20th, 2009. 10:00am-4:00pm. 150+ tables of trains and train-related items. Operating layouts HO, O, S, N, G scale. \$5.00, children 10/under free. Bill Mixon 302-537-5557; John Hodges 302-682-4652.

FL, DELAND: 28TH FLORIDA RAILFAIR. Volusia County Fairgrounds. Tommy Lawrence Arena. July 11th, 2009. 9am to 4pm. Adults \$6 (under 12 FREE). Large operating layouts. Over 250 tables. Miller, 3106 N Rochester St. Arlington, VA 22213. 703-536-2954 E-mail: rrshows@aol.com

IL, GALESBURG: GALESBURG RAILROAD DAYS TRAIN SHOW. Carl Sandburg College, 2400 Tom Wilson Blvd. June 27-28, 2009. Saturday 9:00am-5:00pm, Sunday 10:00am-4:00pm. Admission \$5.00, children under 12 free w/adult. Free parking w/shuttle bus. Proceeds to CSC Scholarship Foundation. Info: 309-341-5327, harrygrossman@hotmail.com

MD, TIMONIUM: GREAT SCALE MODEL TRAIN SHOW. Maryland State Fairgrounds, June 27-28, 2009. Saturday 9:00-4:00pm, Sunday 10:00-4:00pm. Adults \$9.00, family \$18.00, under 15 free, good for both days. 450 vendor tables plus outdoor garden layout and train movies. Free parking. Howard Zane 410-730-1036, hzane1@comcast.net www.GSMTS.com

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TX, NEW BRAUNFELS: SUMMER MODEL TRAIN SHOW

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WI, LA CROSSE: 19TH ANNUAL RAIL FAIR. Copeland Park, Rose & Clinton Streets. July 18, 2009, 10:00am-5:00pm. Admission \$5.00, children under 12 free. Railroad Model, Toy and Memorabilia Show, Sale and Swap Meet. Railroad Exhibits and Displays. Contact 608-582-4761.

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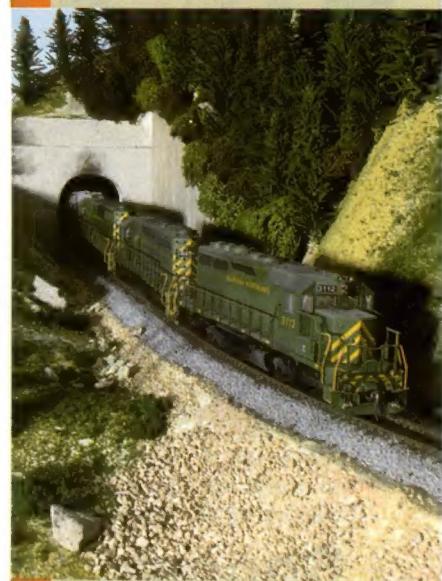
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The Operators

Andy Sperandeo



Engine 963 on the Southern Pacific's subsidiary Texas & New Orleans is an example of the kind of 2-10-2 freight power you might choose for a freelanced model railroad set in the Lone Star State. H. Richard Edsall photo

Choosing locomotives for operation – part 2

When you're modeling a prototype you can follow the guidelines I suggested last month for a realistic locomotive roster: Use models of the engines the full-size railroad used at the time and place you want to model, and use the model engines in realistic roles.

If you're freelancing you have to create a believable story for your fictitious prototype, but you can still follow the example of actual railroads. That'll help you create a locomotive roster that both looks realistic and makes sense.

Place and time. Let's suppose we want to set a freelanced model railroad in Texas, and we imagine it's part of a line connecting Houston and the Gulf Coast with Chicago and other Midwestern cities. That gives us both the scope of a major rail system and a focus on its southern end.

Like so many others, we like steam engines and first-generation diesels, so we'll be modeling the transition era. We'll pick 1952 as late enough for steam to still play a major role and to allow some range in our choice of diesel power.

What do the neighbors do?

Looking at the steam power on other major roads with north-south lines in eastern and central Texas, we find that both the Atchison,

Topeka & Santa Fe and the Southern Pacific used 2-10-2s as their principal freight locomotives. That's not the only choice, as both owners of the Burlington-Rock Island Joint Line between Dallas and Houston favored 2-8-2s, as did the Missouri Pacific in this region.

We decide we like 2-10-2s (I do, at least). Significantly, we know we can get good United States Railroad Administration (USRA) heavy 2-10-2s in HO scale. We can convert them to model oil burners, as is more appropriate for Texas, and add details to make them look like engines built in the early 1920s (as the prototypes were) and modernized in the 1930s and '40s.

We can also decide to use USRA light 2-8-2s as secondary power and for way freights. And we might want an older, lighter engine such as a small 4-6-0 for service on a branch line with trestles that can't take our heavier steamers. Besides adding a little variety, the smaller engines also help to emphasize the importance of the big 2-10-2s.

The future is diesel. Our railroad is changing with the times, but we want to keep our 2-10-2s in charge for the time being. Let's say the system is replacing its coal-burning engines in the Midwest first, and it will fully dieselize the Texas lines later, maybe next year.

Nevertheless, we'll run one cab-diesel-powered daily fast freight each way between Chicago and Houston, bringing merchandise south and taking perishables and refinery products north. The Santa Fe had likewise dieselized its trains 39 and 40 by this time. Competing with that service is also a good way to show what new power will finally replace the old steamers.

We'll have diesels in passenger service and in yards, of course, since that's where the economies of diesel operation were first proven. We'll need passenger diesels for our streamliner between Chicago and Houston, and also for a mostly heavyweight accommodation train. But we'll "keep in service" a couple of the USRA light 4-8-2s that these diesels replaced, both for extra sections and specials, and because they're useful as freight engines.

Diesel switchers will cover all 24-hour yard assignments, but we might still have a USRA 0-8-0 or two for switch jobs that work only one or two tricks (shifts) a day.

(Using USRA models for most of the steam power helps our engines to have a "family resemblance.")

Class and how to get it. Especially for a freelance model railroad, it's important to have several of each of the most important engines. Real railroads acquire locomotives in groups or classes, and we want to see that in our roster of models too.

We'll want a number of 2-10-2s, and a couple of the freight diesel sets for our Chicago trains. We can pick one type for all our diesel switchers, and use the same kind of passenger diesels on our streamliner and our secondary train. That way those will look like classes too.

Wherever and whenever you want to set your freelanced line, you can achieve believable realism with the same approach. **MR**

More on our Web site

Eric Brooman and Bill Darnaby tell the stories behind their Utah Belt and Maumee Route locomotive rosters at www.ModelRailroader.com.

Ride out of the Sunset



► Black GS-4's were still used in Daylight Service, despite the loss of the Daylight scheme

The N scale Southern Pacific GS-4 is back and sporting an all-new look - 1940's wartime-era black paint to reflect a time when GS-4's did more than just passenger service, doing double duty pulling freight as well as moving the Morning Daylight up and down the California coast, having the lettering "Southern Pacific Lines" until as late as 1946 where the lettering changed to a larger "block" style.

► Some GS-4's remained black after the war, while others were restored to their original colors

The black paint job not only made the locomotive less visible from the air, it also meant easier repainting and maintenance when the locomotives got dirty; an easy thing for a big steam locomotive to do, especially when pulling freight duty pulling grain hoppers or coal.

LOCOMOTIVES

126-0303	4-8-4 GS-4 SP Wartime Black "Lines" #4431	\$198
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PASSENGER EQUIPMENT

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FREIGHT EQUIPMENT

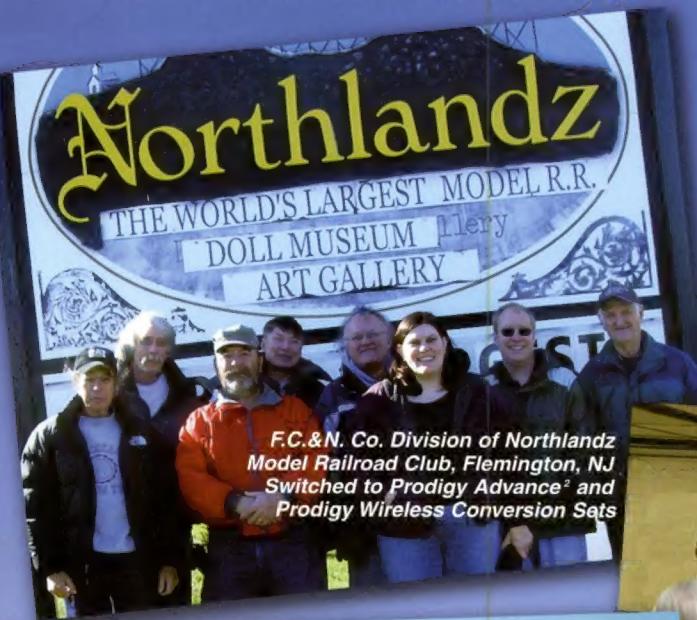
186-0210	ACF 70 Ton Closed Hoppers 2-Car Set SP #90602, 90801	\$28
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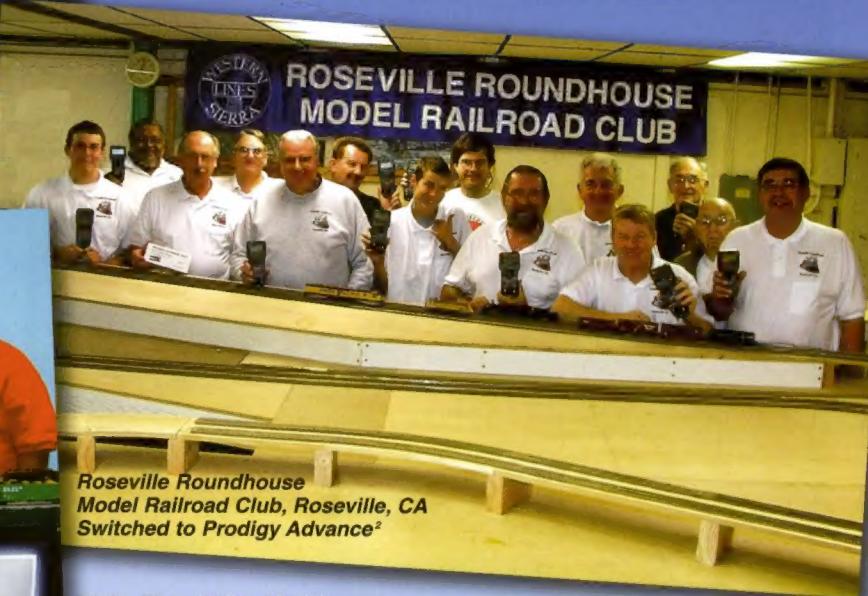
Clubs across the country are switching to MRC's Prodigy Advance² DCC system and Prodigy Wireless. Changing systems is time consuming, disruptive and costly. The decision to switch isn't made lightly. Yet time and again clubs are putting their existing systems aside to embrace the technology and user-friendly design that has made Prodigy the leader in DCC. *Prodigy Wireless is available as a stand-alone system or conversion set.*

The reasons

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